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(For further details, use Key # G-1 on free Inquiry Card on page 71)

TO SAFETY ENGINEERS CONCERNED WITH

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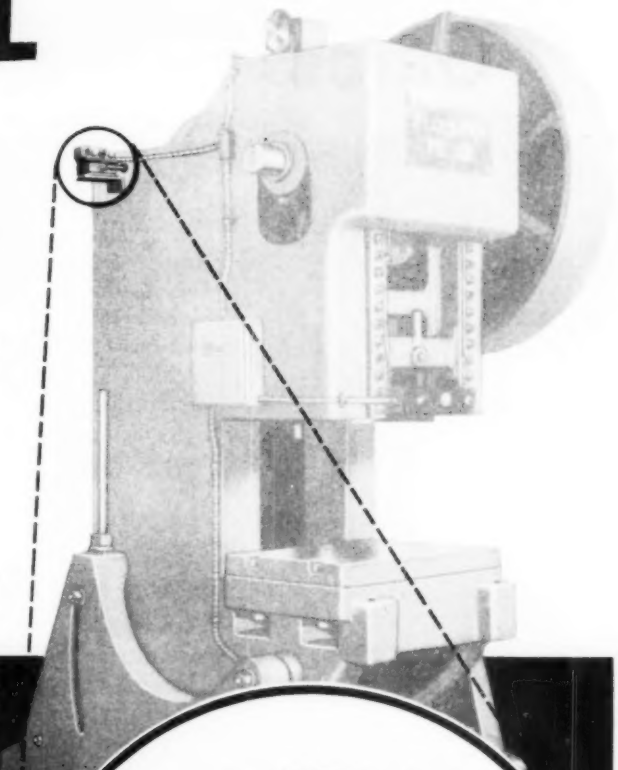

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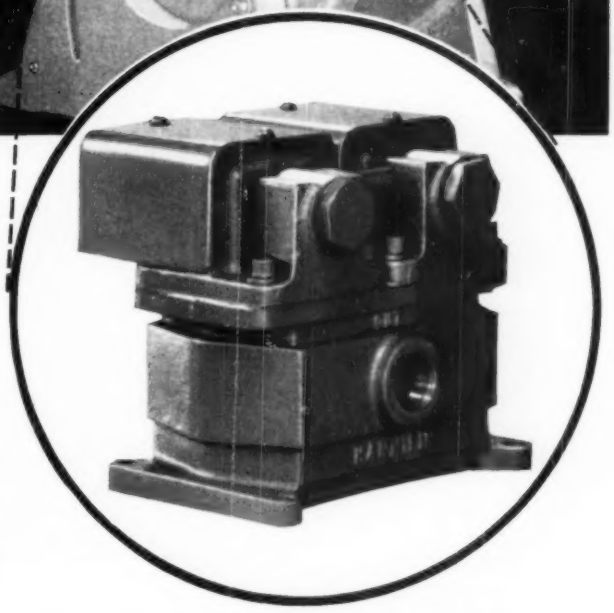

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THE FUTURE SHOWS

Harrisburg, Pa. *Sept. 16–17*

Pennsylvania Industrial Safety Conference (Hotel Penn Harris). Frank K. Bohl, deputy secretary, Dept. of Labor & Industry, Room 304 So. Office Bldg., Harrisburg, Pa.

York Harbor, Me. *Sept. 17–18*

Sept. 17–18. Twenty-Sixth Annual Maine State Safety Conference (Marshall House). A. F. Minchin, secretary, Industrial Safety Division, Department of Labor and Industry, Augusta, Me.

Chicago, Ill. *Oct. 19–23*

Forty-first National Safety Congress and Exposition. (Conrad Hilton Hotel.) R. L. Forney, general secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Cincinnati, Ohio *Nov. 17–18*

Third annual Greater Cincinnati Safety Conference. (Sheraton-Gibson Hotel.) Kenneth R. Miller, executive director, Greater Cincinnati Safety Council, 1203 Federal Reserve Bank Bldg., Cincinnati 2, Ohio.

New Orleans, La. *Dec. 7–8*

Louisiana Safety Conference (Roosevelt Hotel). Charles E. Doerler, conference secretary, Caddo Bossier Safety Council, Inc., 610 Edwards St., Box 806, Shreveport, La.

Philadelphia, Pa. *March 10–11.*

Twentieth Annual Philadelphia Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Walter W. Matthews, Managing Director, Philadelphia Chamber of Commerce Safety Council, Architects Building, 17th and Samson Streets, Philadelphia 3, Pa.

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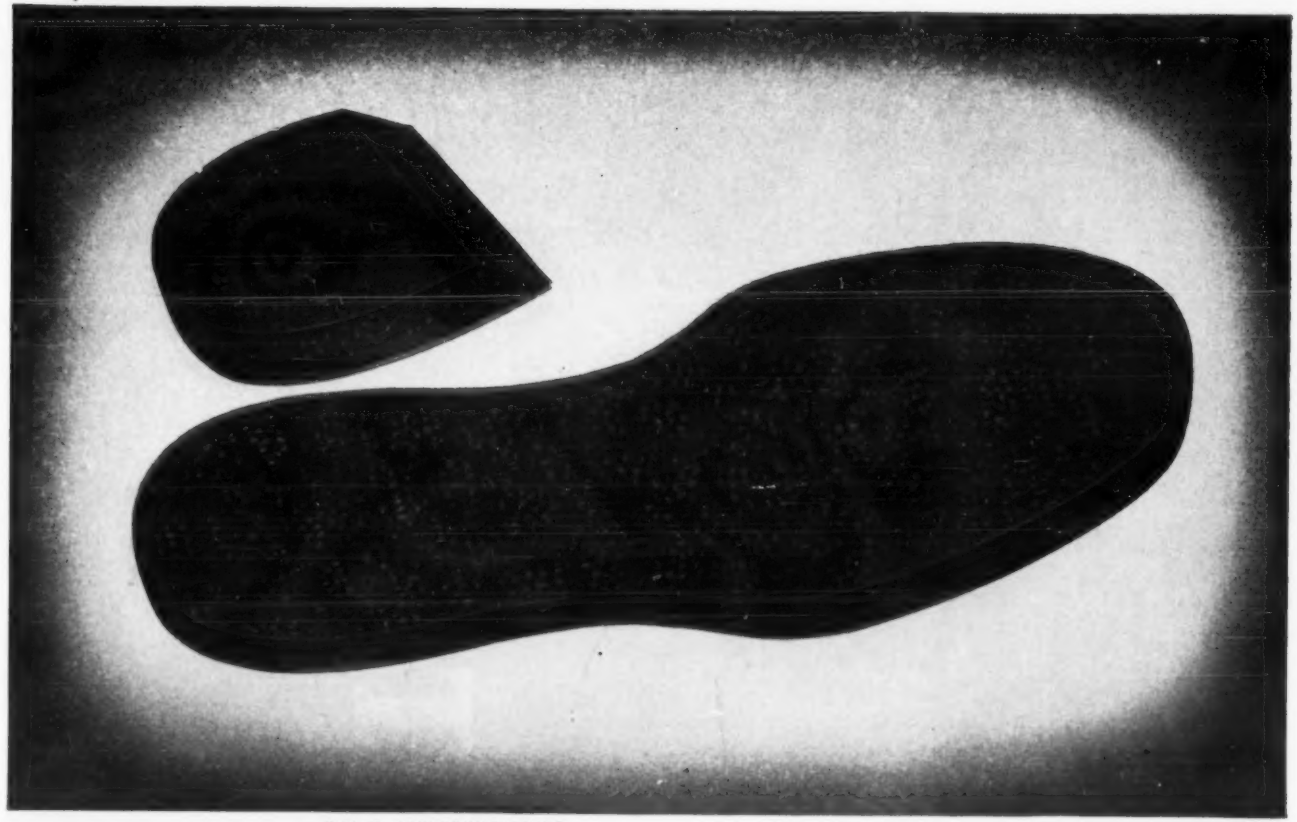

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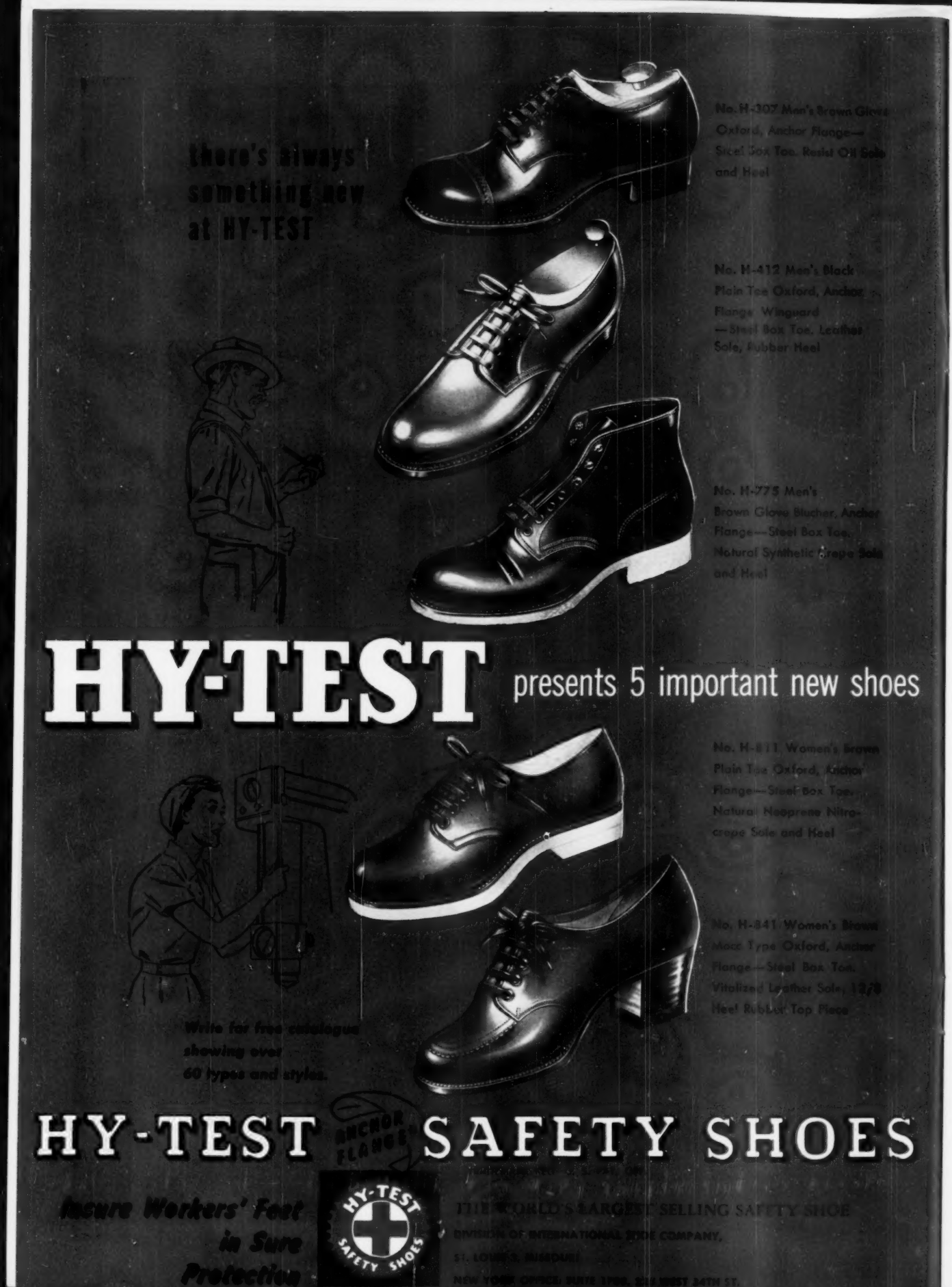
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FORMERLY "SAFETY ENGINEERING"

EST. 1901

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SAFETY MAINTENANCE & PRODUCTION is indexed regularly by Engineering Index, Inc., New York

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(pages 2 and 3)

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Your employee's self interest in his own safety is always emphasized. Even household hazards are covered to keep him safety-conscious every minute, not only in the plant, but at home and on the way to work.

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It's Safe to Say

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★ LABOR SPEAKS FOR SAFETY

ORGANIZED labor is becoming increasingly conscious of the many benefits of accident prevention. It is encouraging to note that unions and their rank and file recognize that cooperation is the life-blood of safety and that both management and labor must work together to prevent accidental injury.

For too long the entire crusade for accident prevention was considered the responsibility solely of management. In fact, over the years employers unfortunately became familiar with indifference and downright resentment where safety was concerned. By means of years of patient and often discouraging effort, plus the expenditure of large sums, management has been able to convince labor that the burden of accidents falls upon both segments of our society.

In the past many individual workmen resented safety "preaching." They were reluctant to grasp innovations designed for their own protection and actually have been known to base organized grievances on opposition to protective measures. No one will ever know how many hundreds of times management and safety leaders have been confronted with refusal to obey safety rules, subterfuge to avoid wearing personal safeguards, attitudes of bravado, reckless acts or indifference which sent the accident graphs soaring.

It is an unusual departure, if somewhat drastic, when organized labor threatens to strike against unsafe conditions in a heavy industry.

According to a news dispatch, a strike of 2,500 employees was narrowly averted in a large motor plant when the employees complained about oil seepage from machines which allegedly made walking unsafe on slippery floors.

A spokesman for the union reported that the danger of slipping and falling was intolerable and management was presented with a virtual ultimatum to clear up this hazard.

On the other side of the picture it was pointed out that management had endeavored to remedy the unsafe condition and the problem finally was solved to the satisfaction of the employees.

It is generally known that the slipping menace is practically at the top of the list of all industrial hazards. Obviously, more men walk or stand in connection with industrial operations. Progressive firms know that oil absorbents are on the market to deal with inevitable seepage or oil spills and it should be a simple matter to remove those potential danger spots.

Of course, many grievances have as their basic cause working conditions having little or nothing to do with accident prevention. In such cases, it is manifestly unfair and even intellectually dishonest to hide behind any real or fancied threats to safety.

The cause of accident prevention is best served, not by drastic measures such as walk-outs, but by orderly conferences in which both management and labor accept divided responsibility to reduce costly accidents.

In this enlightened day of good labor relations, the conference table is the best possible meeting ground to iron out differences of opinion. Certainly this is true when the safety of personnel is involved.

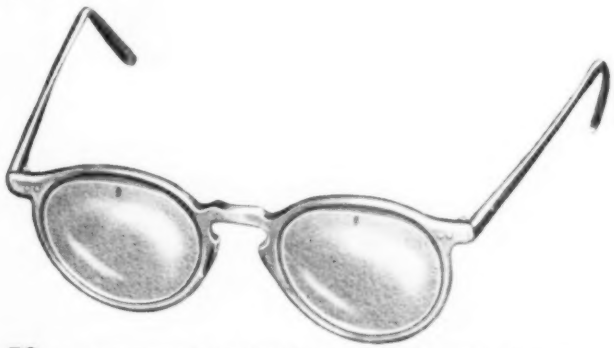
Management is providing the remedial measures to combat accidents. It is up to labor to employ those measures with vigor. Thus both sides benefit and the nation is spared unnecessary losses in human as well as economic resources. H.A.

METAL frames or ACETATE...

ALWAYS SPECIFY BAUSCH & LOMB SAFETY EYEWEAR

With some eye-protection problems, a toss of a coin could determine the choice of metal frame over acetate—or vice versa. Usually, though, the job situation dictates the frame type. In any case, the degree of protection depends on the skill in the design, quality workmanship and materials. You can be sure of the quality, always, if you specify safety eyewear by Bausch & Lomb.

H-10—Non-corrosive white metal frame with rigid double bridge construction, actually lighter than its Bausch & Lomb acetate counterpart. Rugged, easy to fit. Cable temples are insulated, sweat-proofed.



Y-70—All-acetate model is ideal for workers whose skin is sensitive to metal frames. A favorite with women because with rigid temples Y-70 is easy to slip on and off without mussing hairdo. As with H-10, above, full range of bridge sizes and lens sizes. Ideal for safety lenses ground to worker's prescription. Ask for full data: Bausch & Lomb Optical Company, 90519 Smith St., Rochester, N.Y.

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SAFETY MAINTENANCE & PRODUCTION
VOL. 106, No. 1 • JULY, 1953

WHAT REALLY CAUSES ACCIDENTS

By S. ROSS CARR

THE accident prevention problem has many facets and there are many approaches to its solution which have merit. Safety meetings, posters and other similar promotional media are valuable, but we cannot place all our confidence in a shotgun approach to safety.

If our efforts are to be truly effective, we must "rifle shoot"—that is, we must identify our target by discovering the basic causes of each accident and then aim our corrective efforts at this specific target. If injuries are being caused primarily by slipping on oily floors, we can pass out goggles like crazy without much improvement in our frequency rate. The finest eye protection in the world won't prevent falls.

Here's how an accident should *not* be investigated and reported. Joe Doakes reports an injury to his foreman. The foreman says "That's too bad, Joe. You had better go by the office and make out a report." The injured employee relates the incident to the timekeeper or chief clerk. The clerk writes it up and adds a comment that the accident was due to carelessness of the injured employee. He adds a further comment that, as insurance against recurrence, the case will be discussed at the next regular safety meeting. That, in my opinion, is almost worse than no report at all.

Accident Sequence Technique

If, on the other hand, the foreman has been trained in scientific accident investigation through use of the accident sequence technique, his report will be something entirely different.

Behind every injury lies an accident, an unplanned, unwanted occurrence. A hammer flies out of a workman's hand and strikes a coworker. To apply effective control,

(Continued on page 26)

LET VACUUMS EAT YOUR

By REVIS L. STEPHENSON
Mgr. Air Appliance Division
U.S. Hoffman Machinery Corp.

FOR fifty years American industry has been fighting a grim battle against the menace of dust. Today—aided by increased knowledge and better materials—it seems to be gradually winning this fight.

The knowledge and better materials came slowly. They appeared when industry first recognized dust not as a mere annoyance—but as an actual threat to the health and safety of plant personnel—and recognized, too, that industrial cleanliness is vital to efficient operation and production.

Dust is dangerous. It is a health hazard, a fire hazard, an explosive hazard, a danger to the product itself. Its overhead deposits hold moisture whose corrosive action reduces the life of structural steel . . . dust may lead to toxic poisoning and eye injuries . . . it can damage the lungs of workers . . . and, it can ruin employee morale in a plant.

With the knowledge that dust can be dangerous came the realization that the problem of disposing of it is a major one. In an attempt to solve this problem, industry first tried—and found wanting—several basic methods of dust removal.

Attempts to Control Dust

One of the methods tried was the low pressure dust collecting system which controls and collects dust from the point of origin. This method, while effective and necessary, was found to be inadequate when used alone; since in many plants it is impossible to prevent some dust from escaping.

Another method—and by far the most popular—involved manipulation of the humble broom. But, although it has been used for centuries, the broom was found wanting as a modern factory dust remover. When floors are swept by brooms, a thorough and complete cleaning job is never accomplished because brooms don't actually *remove* dust at all . . . they merely stir it up and redistribute it throughout the plant.

In addition, plant engineers have found that the broom is ineffective even as a floor sweeper. Floors with cracks in them cannot, for instance, be swept really clean—even if the floor is wet down before sweeping. A coating of dust and dirt withstands the wetting to remain on the floor even after sweeping is completed.

Vacuum Cleaning

But, despite its obvious drawbacks, sweeping is still the most practiced form of dust removal. Only during the last 10 years have an increasing number of plant owners switched to vacuum cleaning—a much more effective way of maintaining good housekeeping in a plant.

For vacuum cleaning—a sure method of improving plant efficiency—maintenance men are indebted to American women who long ago learned that the broom, brush and dustpan are as out of date as the moustache cup.

The biggest advantage of the vacuum cleaner is its ability to eliminate dust deposits *without dispersing more dust into the atmosphere*. When cleaning with vacuum, dust is immediately drawn into the suction nozzle. No dust fog is formed, and the air is clear.

A second great advantage of the vacuum cleaner is its adaptability as an important supplement to regular low pressure dust collecting equipment. A vacuum cleaner begins where the low pressure dust collecting system leaves off. With the vacuum method—in one operation of cleaning—all dust drawn into the suction nozzle is transported to the vacuum cleaning equipment. There are no piles of dust to be swept up.

Vacuum Attachments

Vacuum cleaning units are equipped with special nozzles for various purposes. Floors are swept with wide channel nozzles attached to curved floor rods and equipped with lengths of flexible rubber vacuum hose to permit rapid manipulation of the floor nozzle. In addition, round and oblong nozzles, soft and stiff bristle nozzles, and overhead flat surface brushes and gulper nozzles are used for cleaning overhead surfaces, walls, windows, ledges, duct work, piping, columns and similar interior surfaces.

Long, lightweight extension rods permit operators to reach far above floor level and into out-of-the-way corners. A non-conductive fiber nozzle is used for cleaning motors, starters and other electrical equipment.

Vacuum cleaners today are available in both portable and stationary types. Portable machines—used for general cleaning in smaller plants and for spot or local cleaning in larger establishments—operate with one or two hose lines, which—in the larger type of machine—can each be 50, 75, or 100 feet long.

In some vacuums dust and dirt drawn into the suction nozzle are conveyed through the flexible rubber vacuum hose to the machine, where they enter the dust separator for separation from the air. This is accomplished by a combination of cyclonic action, plus the use of inverted filter bags which effectively filter the dust from air, permitting only clean air to be exhausted into

the room. Since the filter bags are inverted, they never fill with dust, and need not be removed for cleaning.

Stationary Vacuums

The stationary vacuum plant is usually more effective and economical when applied to general cleaning in larger plants having wide areas and several levels. In these plants the vacuum cleaning separators are set up at a point convenient for disposal of collected material. Cleaning may be carried on in a continuous manner at many scattered points in the plant because of the greater operating capacity of the stationary vacuum cleaning system. All material is conveyed through the piping system to the vacuum cleaning equipment where it enters the dust separators for separation from the air. The separators themselves are

DUST!

Vacuum cleaner with extension tubing thoroughly cleans hard-to-reach dust trap.

Working from a stationary vacuum cleaning system, a maintenance man cleans the floor around a dryer in a corn-processing plant.

Workman uses vacuum cleaner with attachment to remove dust collected on beams.

large enough to permit cleaning for long periods without the need for stopping operations for dust disposal. They can also be equipped with rotary discharge valves for continuous disposal of material as it is collected.

Vacuum Applications

Here's how several shop owners have applied vacuum cleaning equipment to their plant needs:

A Chicago firm, harried for years by the dust menace, found that a vacuum cleaning system successfully removed dust which had eluded all previous efforts to regulate it. Hand sweeping of the dust had already proved to be inadequate, costly and unsafe. The heavier particles of dust would eventually settle down to where they could be swept up but the finer particles when once again distributed into the atmosphere were beyond control, a health and safety hazard.

The Chicago firm then installed a vacuum cleaning and sweeping system designed for heavy duty industrial operation. Now, more than 100 tons of dust are removed each year from this plant. In maintaining this program of "good housekeeping" the company not only provided safer and more healthful working conditions for its employees but also assured a degree of cleanliness in its product that it had not approached before.

A similar problem recently faced the plant engineer of a jet engine factory in the mid-west. There the problem was intensified by the secrecy of the work under construction, the danger in dust to the health of the workers, and the constant threat of explosion brought about by tiny particles of aluminum and magnesium dust on the floor of the plant.

In this instance, the problem was solved by permanent vacuum cleaning units strategically placed in the plant. At the plant today there are twice as many primary separators as secondary collectors. They are spaced to provide greater flexibility and minimize explosion hazards by shortening the runs and removing explosive dust as close to the point of gathering as possible.

The Delaware and Hudson Railroad, in Albany, N. Y., recently installed 2 portable vacuum cleaning units. One unit was mounted on skids in the locomotive repair end of the diesel engine shop and is used for cleaning purposes before repair starts on the engines. With the use of this unit it has become a simple matter to clean completely the outside of the engine and the inside chamber housing the diesel motors. The vacuum cleaners collect a good deal of fine road dust that has been picked up while the engines are in service. In addition they remove water from the floor. The water and oil are collected in a water trap permanently mounted over a drain at the end of a ramp, thus removing all hazards to safety at that end of the shop.

The second vacuum is used throughout the shop and is often applied to freight car and Pullman car cleaning before repairs are started on the cars. The freight cars frequently contain so much dust that the company for years has recognized them as a menace to safety in the shop. Today this dangerous dust deposit is successfully removed by the cleaners.

Throughout the nation other plant engineers are discovering that dust accumulations difficult to remove by ordinary methods are readily cleaned by vacuum. The time and labor consumed in vacuum cleaning are actually used for *cleaning*—for removing dangerous and obnoxious dusts—and are not wasted in scattering dust about in the air and then gathering and rehandling it again. The vacuum method of cleaning, these plants have learned, is not only more efficient, it is also safer and more economical. And—as intelligent plant owners know—if you can't afford safety, you can't afford to stay in business.

Pictures by courtesy of U.S. Hoffman Machinery Corp.

High School Student Joins Wise Owl Club

SEVENTEEN-YEAR-OLD Ralph Nickey, of Milton, Pennsylvania, has become the first high school student to qualify for membership in the Wise Owl Eye Safety Club.

Dr. Franklin M. Foote, executive director of the National Society for the Prevention of Blindness which is the official sponsor of the club, says that Ralph won the distinction March 2, in the machine shop of the Milton High School, when a flying tool part struck his safety glasses, which saved him from losing the sight of his right eye.

Wise Owl Club membership, held by more than 4,000 industrial employees throughout the nation and Canada, is restricted to those who were wearing eye protection at the time of accidents which might otherwise have caused blindness.

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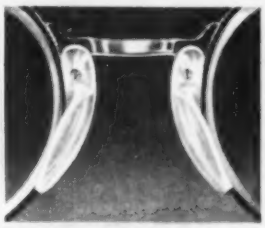

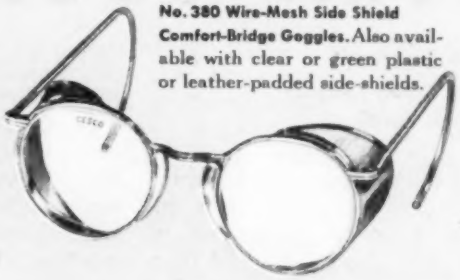

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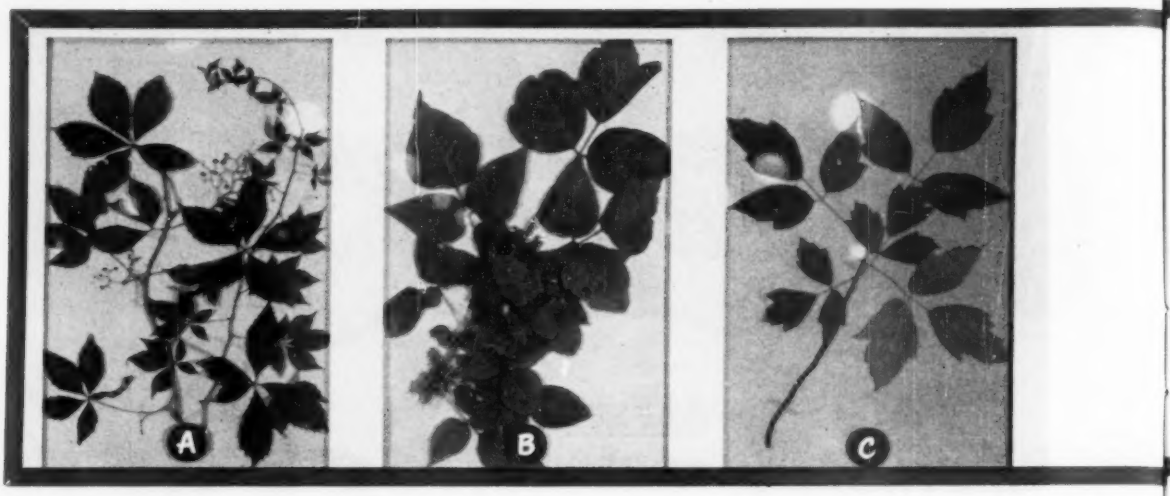


INSTRUCTIONS:

You will note that there are six plants pictured, each with a letter directly beneath it. Three of these plants are poisonous, namely, poison ivy, poison oak, and poison sumac. The other three are non-poisonous but are those most often confused with the poisonous types.

Select the three which you believe are the poisonous species, and mark an "X" in the proper square. At the end of this article you will find the correct answers, along with the percentage totals of numerous safety personnel from all sections of the country. How do you compare? The pictures and following article will better equip you to recognize and cope with the poisonous plant hazard.

THREE OF THESE PLANTS ARE YOUR ENEMIES . . .

By R. P. WHITNEY*
Medical Supply Company
Rockford, Illinois

IN practically every section of the United States, one or more species of poisonous plants can be found. Learning to recognize these plants and avoid them is the most direct way to save yourself and your company personnel many painful experiences. Poisonous plants may be found in fields, woods, along fences, in rock walls and hedges, lawns, gardens, and even as ornamental vining on buildings. Your ability to identify them and to take all precautionary measures may save many valuable man-hours. It has been estimated that, each year, there are 250,000 cases of ivy poisoning, alone!

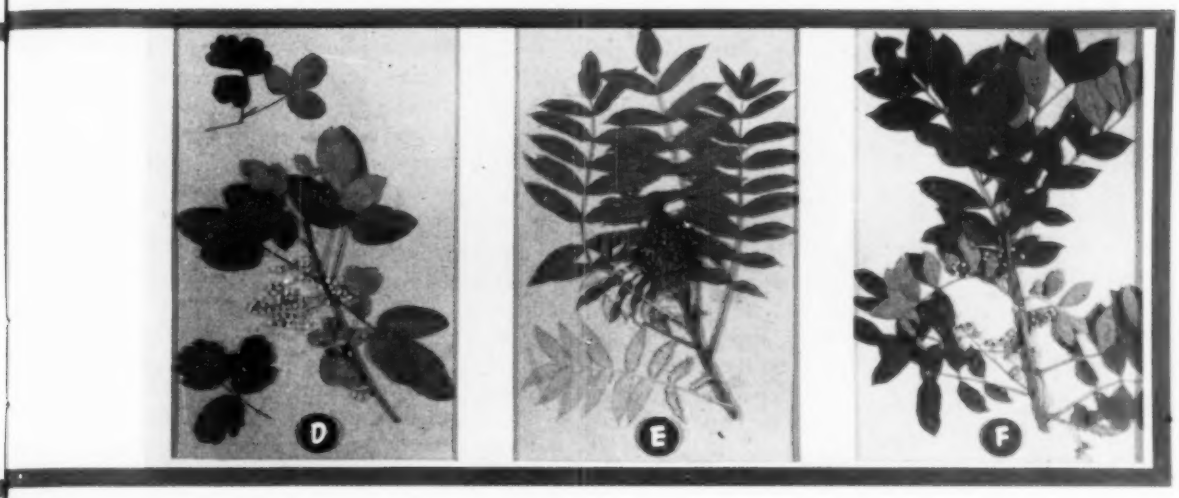
If the test you just took indicates that you cannot identify at least 2 of the 3 poisonous plants shown, your chances of plant poisoning are high enough to merit self education in identification. Although there are many varieties of poisonous plants, there are 3 which possess the basic characteristics found in most sub-types. They are poison ivy, poison oak, and poison sumac. In order to properly identify each type, there are 5 plant features which will label it friend or enemy. These features are probable locations, typical growth habit, leaf pattern, flowers and fruits. Let us discuss each of the plants from the standpoint of these 5 common traits.

POISON IVY

Poison ivy in some form may be found in nearly every section of the country except the very extreme West. In many locales, it may be called by other names such as three-leaf ivy, poison creeper, climbing sumac, poison oak, markweed, picry, and mercury. The botanical name commonly applied to this specie is *Rhus radicans*.

Poison ivy generally grows as a climbing vine, appearing most often in wooded regions where trees encourage its growth. It may also appear in a vine form running along the ground or mixed with shrubbery. Many unsuspecting persons have cultivated these vines on stone walls or houses, as they make excellent ornamental plants. This use should never be tolerated, as it will almost certainly result in accidental poisoning and further propagation.

Along fences, in open fields, or in full light, poison ivy may take the form of a low growing shrub anywhere from 6 to 30 inches in height. Growth pattern is usually either as



	A	B	C	D	E	F
POISON IVY	☐	☐	☐	☐	☐	☐
POISON OAK	☐	☐	☐	☐	☐	☐
POISON SUMAC	☐	☐	☐	☐	☐	☐

FEATURE

First of a feature series on Skin Protection. Next articles will appear in August & September issues.

WHICH IS WHICH?

a vine or shrub, although both forms may be found in close proximity.

The leaves of the poison ivy plant are always composed of 3 leaflets. Only one 3-parted leaf extends from each node on the plant stem, never occurring in pairs. The leaflets may have either even or lobed (indentations part way down the leaflet) margins, and both types of leaflets may appear on the same plant. Lobed leaves are not positive means of identifying poison ivy.

When flowers are produced, they appear in clusters on the side of the stem directly above a leaf. Flowers do not always appear on the plants, nor are fruits always berry-like. The fruits are very helpful in identifying the plant, especially in the fall, winter, and very early spring. They afford a positive means of identification, since they are white and waxy in appearance. Distinct lines mark their outer surface, somewhat like a peeled orange. Although rarer types of poison ivy may bear fruit covered with a very fine hair, the more common type of poison ivy produces fruit which is entirely smooth.

OAKLEAF POISON IVY

One of the most frequently encountered types of poison ivy other than the common variety discussed above is oakleaf poison ivy. It is quite common in Eastern and Southern areas. Although it is erroneously called poison oak on occasion, it is not the true Western poison oak. It usually appears as a low growing shrub, and the branches are covered with a fine growth of hair. The leaflets occur in threes, and the center leaflet is usually lobed similarly on both margins. The lateral leaflets are often very irregularly lobed. The lighter color on the underside of the leaflets is caused by fine surface hairs. The fruit of the oakleaf poison ivy has much the same appearance as common poison ivy, although the individual fruits and stems are often covered with a very fine hair-like growth.

POISON OAK

Poison oak, chiefly a West coast plant, may be found growing in parts of California, Oregon, and Washington. It is not related to the family of oak trees but it is a close relative of poison ivy. Both poison oak and ivy are often found growing in the same areas. It is sometimes referred to as either yeara or poison ivy. This particular spe-

cies is called *Rhus diversiloba*. It is usually found growing as a rank upright shrub with many small woody stems rising from the soil. It may, however, take on the general appearance of a vine, attaching itself to fence posts, telephone poles, trees, etc. Even in the vining form, the stems tend to grow upward rather than entwined around some type of support.

The leaves of the poison oak plant consist of 3 leaflets with much irregularity of lobing. Sometimes lobes appear on both sides of a leaflet similar to an oak leaf—hence the name. As in the case of poison ivy, some plants may have leaflets with an even margin and no lobing. The surface of poison oak leaflets is usually uneven and quite glossy, giving them a thick leathery appearance.

The flowers appear in clusters on slender stems, originating at the axis of the leaves. The flowers are greenish-white in color and measure about one-quarter inch across.

The fruit may appear either as greenish or creamy-white berries in the early fall. Also, as with poison ivy, they are segmented like a peeled orange. All plants do not produce fruit, and the poison oak fruit may appear flattened on occasion. It is easy to identify the plant in the fall and winter, since the fruit remains on the plant.

POISON SUMAC

Poison sumac may be found growing Eastward from Minnesota, Illinois, Indiana, Kentucky, Tennessee and Texas. It may be called swamp sumac, poison elder, poison oak, poison dogwood, or thunderwood. Unlike poison oak and poison ivy, it does not have variable forms and it never appears as a vine. Science has labeled it *Rhus vernix*.

Poison sumac takes either the form of a small tree or a woody shrub, usually inhabiting the fringes of swamps or bogs. The plant prefers moist soil, although an occasional isolated plant may be propagated by nature in an open dry area. Such isolated plants are more likely to cause poisoning to an unsuspecting person, since they are not as quickly identified as those growing in extensive clumps.

Don't let the proverbial "Leaflets Three, Let It Be" misguide you in identifying poison sumac. The leaves are composed of 7 to 13 leaflets arranged in pairs on the midrib, with a single leaflet at the tip. The individual leaflets are about 3 to 4 inches long and 1 to 2 inches across, being void of lobes or serrations on the margins. In the spring they appear bright orange in color, later becoming dark green and glossy on the upper side and pale green on the under side. In the early fall, they turn to a brilliant red-orange.

The small yellowish-green flowers appear similar to poison ivy flowers, although they hang in much longer clusters. The clusters appear at the axis of the leaves along smaller branches.

Poison sumac fruits resemble those of poison oak and ivy, but they hang in much longer clusters, ranging from 10 to 12 inches in length.

There are several species of non-poisonous sumacs which have the same general appearance as the poisonous species. Learning to identify these will assist in recognizing and avoiding the hazardous kind. The non-poisonous types are smooth sumac, staghorn sumac, and dwarf sumac. All 3 of these non-poisonous types have red fruits which form a terminal seed head. This is easily distinguished from the slender hanging clusters of white fruit of poison sumac. The leaves of smooth and staghorn sumac are lace-shaped with serrated margins, usually having more than 13 leaflets. The leaves of dwarf sumac have smooth margins like the poisonous species, the identifiable exception being that the dwarf sumac leaves have a winged midrib. The latter is never true of poison sumac.

Precautionary Measures

1. LEARN TO RECOGNIZE AND AVOID ALL POISONOUS PLANTS. There is no substitute for the living plant. Study the facts, observe specimens—then watch for it!
2. If necessary to work among or to come in contact with poisonous plants, wear suitable protective clothing.
3. Use protective creams, lotions, etc., on the advice of your medical department.

(Continued on page 23)

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• Payroll Savers are serious savers—of the approximately $6 billion Series E Bonds which had become due up to the end of March, $4.5 billion, or 75%, were retained by their owners beyond maturity.

If you are not among the 45,000 companies that make the benefits of the Payroll Savings Plan available to their employees . . . or if you do have a Plan and your employee participation is less than 50%, a telegram or letter to Savings Bond Division, U.S. Treasury Department, Washington Building, Washington, D. C., will bring you all the information and assistance needed to build a *good* Payroll Savings Plan.

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SAFETY MAINTENANCE & PRODUCTION

4. Decontaminate all objects which might carry the poisonous agent, such as clothing and tools. This precaution also applies to household pets.
5. Eradicate poisonous plants by various approved chemical or mechanical methods. U. S. and local agencies will give advice and assistance.
6. When burning out plants, stay completely away from the smoke. Smoke can carry the poisonous agent.

Symptoms of Plant Poisoning

In spite of precautionary measures, there will always be accidental cases of plant poisoning which will demand treatment. Poisoning is caused by a yellowish violently irritating oil termed *urushiol*. It may be found on the leaves, fruit, bark, stems, and roots of poisonous plants. Experiments have shown it to be so potent that as little as 1/60,000 of a grain dissolved in an oil base will cause poisoning.

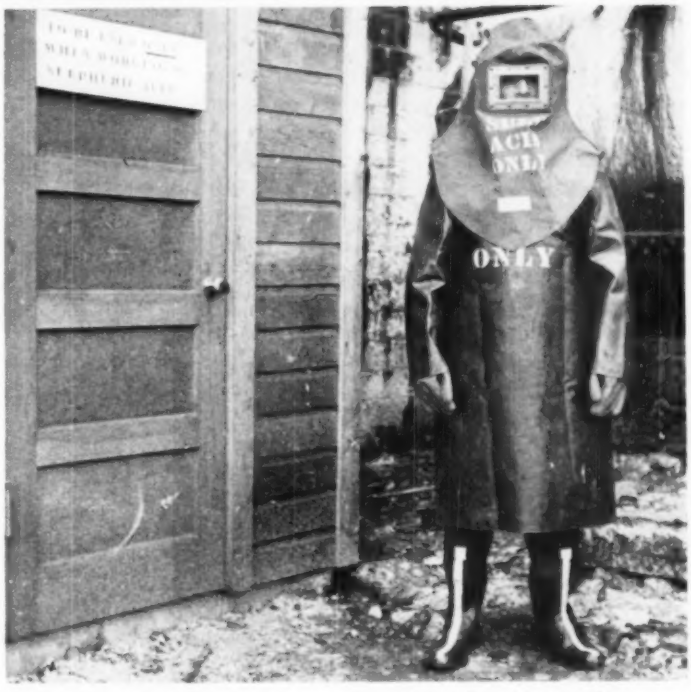
The first symptoms of poisoning are inflammation and swelling, followed by the appearance of blisters. Later symptoms are breaking of the skin and an excretion of fluid. Symptoms are most common within 12 to 24 hours after contact, although they may appear within a very few hours or be delayed several days. This variation of visible symptoms is caused by the reaction of individuals, the amount of poisonous agent contacted, the stage of development of the plant, and also the season. Although it has been theorized by many that an immunity to plant poisoning is possible, medical personnel today believe that such an immunity does not exist. The general feeling is that susceptibility is a matter of degree, being determined by the condition of the individual, condition of the plant, and the circumstances under which a person is exposed.

There are many commercial products available today for the treatment of plant poisoning. Such products should be prescribed by your medical department. Since field operating industries are most likely to suffer from the poisonous plant hazard, the manufacturers of unit-type first aid for field industry have incorporated various first aid solutions, ointments, etc., into the unit system. Thus first aid for plant poisoning can be made readily available in unit-type first aid kits for field personnel.

Once it is determined that an individual may have contacted the poisonous agent, there is an excellent precautionary measure which will greatly reduce the chances of infection. It is the profuse use of hot water and soap. The affected areas should be washed several times and thoroughly rinsed with clear

(Continued on page 61)

"SAFETY MAINTENANCE" Salutes a Safety Idea



Man From Mars?

NO. NEITHER does the above photograph have any connection with the Thing. Nor is it a news shot of the latest experimental, jet-propelled, rocket-fired, subtropospheric, survival suit, completely articulated, provided with hot and cold folding pressurized sections, emergency rations, flotation gear and Gibson Girl—radio, that is.

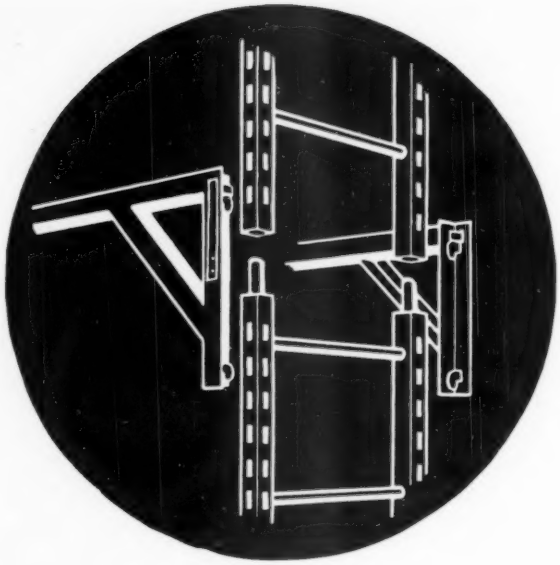
It's an employee of Weyerhaeuser Timber Company's Everett (Washington) pulp division. He is dressed in one of the company's new acid-proof outfits, designed to protect the men who work around sulphuric acid.

All parts of the suit are marked with pink paint—the same color, incidentally, which is used to identify acid pipes—to keep the equipment from being used in any other area of the plant. The pink letters stand out like a lighthouse in the fog.

The suits are stored near the acid-making equipment in special lockers, each of which contains a jug of mild alkaline solution for emergency use in neutralizing acid on the skin.

Picture by courtesy of Weyerhaeuser Timber Co.

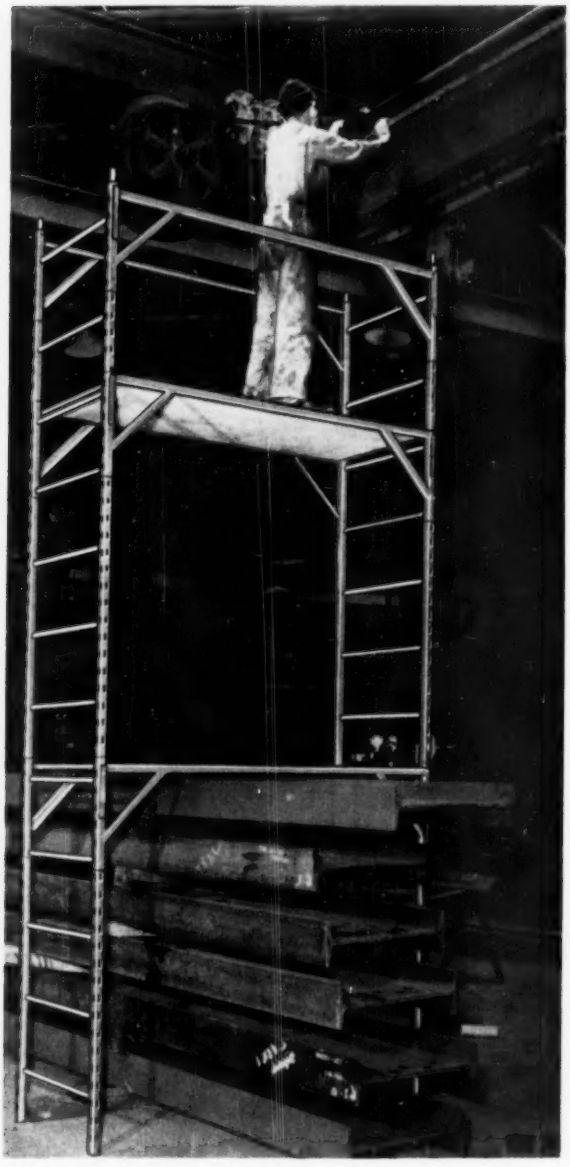
Top ladder section of sectional scaffolding fits over dowels of bottom ladder section. Self-locking truss with safety lugs fits into slots in ladder sections to hold them together.



FEATURE

Second of a series on Ladders and Scaffolds. The third article will appear in August.

Maintenance man works on sturdy, safe sectional platform, which is easily assembled and disassembled to fit over obstacles.



Where Do Most

By E. J. CLARY

WHAT percentage of personnel accidents occur in performing the necessary functions of off-floor building maintenance?

Are measures against building maintenance hazards always made an integral part of the modern safety program?

The industrial interior maintenance accident rate with its costly time loss and suffering mounts with each increase in the size of buildings, with the growing inaccessibility of facilities to be maintained, and the greater need for their protection and care.

For years, the high accident rate involved in industrial interior off-floor maintenance has resulted largely from the tendency of the maintenance staff to be careless and the utilization of makeshift apparatus for "getting at" maintenance points. That is, using unsuitable or wobbly ladders, makeshift scaffolding and other weird high-level apparatus of the "packing-case" variety.

Accident reports indicate that neither workers nor management give sufficient attention to the use of scaffolds. Whether for temporary or permanent use, scaffolds must be erected and used in accordance with rigid specifications. There is no such thing as a temporary scaffold; a scaffold may be erected for temporary use, but if a scaffold is needed at all, the scaffold must be built properly and fastened securely. A scaffold that is to be used for only one day has to be just as strong as one that is to be used for a month—a man does not weigh less just because the job is of short duration.

In many instances, workers are injured when makeshift scaffolds, which were hurriedly erected for jobs of short duration, fall, break, or do not provide sufficient protection to keep the workers from falling. It is management's responsibility, even more than the workers', to see that the use of such scaffolds is not permitted. Only if management has a definite, clearly defined policy regarding scaffolds and maintenance platforms will workers make and use this equipment properly. Such a statement of policy must include specifications regarding the type to be used and the exact design, with particular emphasis on such safety devices as guard rails.

Thorough plant maintenance will find the chief accident hazards are encountered in performing the following routine functions:

1. Cleaning windows, interior glass.
2. Lighting maintenance.
3. Walls.
4. General cleaning.
5. Painting.

Besides the effects of the accident rate on the plant safety program, management must also consider the whole scaffolding problem from the standpoint of maintenance cost. Not only do maintenance accidents result in time losses, but inadequate rules and methods governing the property maintenance program slow up the work and increase its cost. Much of this increased cost is the result of using makeshift apparatus in reaching maintenance points, according to safety engineers, who also say that the matter of proper interior scaffolding has been much neglected both by superintendents and by employers themselves.

Overhead and "Overhead"

Industrial management is well aware of the steadily rising costs of off-floor building maintenance (as against maintenance of machinery and equipment) due largely to the size of modern buildings, better construction, modern touches that need more care and the rising cost of maintenance labor. The matter of modern lighting

Maintenance Accidents Occur?

6. Sign and marker work (interior).
7. Property repair work, minor improvements.

All of these functions are involved in the proper conditioning of almost every building or plant and all of them can subject maintenance operatives to accidents, minor or serious. All of these accidents are costly—to management—and to the injured worker. Consider the facts which reveal the seriousness of accidents in maintenance alone, where so often makeshift, insecure or improperly adjusted and used scaffoldings are relied on.

Out of every 100 building or plant maintenance accidents, about 75 are apparently the direct result of makeshift scaffolding, or scaffolding that fails to protect the maintenance worker. The balance fall primarily in the category of carelessness by the worker, such as:

TAKING UNSAFE POSITION

- *Standing under scaffolds on which men are working or which are being torn down.*
- *Standing on overhanging boards.*
- *Improper stance when using leverage tools.*
- *Short-cutting, climbing up or down, without using ladders.*
- *Over-reaching.*

UNSAFE MOVEMENTS

- *Stepping without looking.*
- *Stepping backward without looking.*
- *Climbing without looking.*

alone (especially fluorescent lighting) makes great inroads on the maintenance budget, although the result in better lighting largely offsets this rise.

Since the apparatus used to reach off-floor maintenance points is the key factor in the safety program, the abilities of the new types of scaffolding are worth study, not only because of their contribution to safety, but also because of their efficiency features which quicken the job, save on its cost and enable the worker to do a better job.

New Types of Scaffolding

In designing the modern, quickly set-up scaffolding safety is the primary objective. For example, self-locking trusses are the central feature of one type of construction. The truss locks are equipped with safety lugs which lock into slots in ladder sections. The platform support trusses therefore cannot be sprung loose even if the scaffolding is tilted or rocked. This feature also makes certain the scaffolding platform will always be level, which is an added safety factor in certain maintenance jobs.

Platforms should be adjustable every few inches for added ease, speed, safety and economy of labor. This feature is especially important when the off-floor maintenance workers are operating on a staggered or uneven floor surface; for instance, over a stairway. Some units are available which can be used without moving desks, furniture, machinery or other set equipment or facilities. For instance, ceilings may be cleaned over stock piles

(Continued on page 34)

What Causes Accidents

(From page 13)

however, we are going to have to go back a step further and look into the cause of the accident. What unsafe condition existed or what unsafe act was performed which caused the hammer to fly out of the workman's hand? The cause of the accident might well have been using a hammer with a greasy handle; or, more clearly, failing to wipe the grease off the handle before using the hammer. If we stop here, we have developed little of value to us in controlling causes or preventing accidents.

At this point one is apt to say the cause of the accident was carelessness—and; obviously, the cure is to tell the workman to "be careful!" As corrective action, this leaves a great deal to be desired. In order to develop usable information upon which to base our corrective action, we must look at the next step in the accident sequence and determine the reason why the unsafe condition was allowed to exist or the unsafe work method was used. Why wasn't the work performed in the correct manner? Why did the workman fail to wipe the grease off the handle before attempting to use the hammer? Why was the correct work method not used?

3 Why's of Accidents

It is possible to build up a sizeable list which would include such reasons as "in a hurry," inattention, daydreaming, eager-beavering, disregard of instructions and inexperience. Actually, however, there can be only 3 basic reasons why a workman fails to use the correct work method. He lacks knowledge or skill, he is physically or mentally unsuited for the job, or he has a wrong attitude. In other words, he doesn't know, he can't, or he won't!

Having determined the reason why the workman performed unsafely, we are in a position to aim our cause control at something specific. To reprimand an employee for using an unsafe work method will be entirely fruitless if he performed unsafely because he didn't know how the work should be done. Any effort to prevent a repetition of this accident must concern itself with imparting to this workman the knowledge he lacks. Where the workman is physically or mentally unsuited, the problem, on the other hand, is one of placement; and, if he performed unsafely because of a wrong attitude, appeal or persuasion should be used, or, in rare instances—discipline. Now we are truly "rifle shooting."

One final step in the accident sequence remains, however. Before determining correctly the method to be followed in teaching, placing, or persuading, we must consider the characteristics of the workman involved. The approach to the problem must be keyed to his individual traits of character. The hotheaded individual and the show-off may both disregard instructions and perform unsafely. But it becomes evident immediately that efforts toward replacing wrong attitudes with desirable attitudes will be entirely different in these 2 cases.

Following this accident sequence procedure should result in an improvement in personal injury frequency rates. It is clear that men are injured because incorrect work methods are followed. Isn't it true that using the wrong work method is behind all production upsets? Isn't it practically impossible to have either an accidental injury or other production upset when using exactly the correct work method?

When Is Accident Control Possible?

Consider this example. An employee is repairing a leaky flange on a riser at a tank battery from which a small amount of oil is spraying. Although his clothes are partially soaked with fresh oil, he builds a fire 50 feet from the fire wall and makes frequent trips to the fire to warm himself. Here are three steps of accident sequence. But it isn't certain any accident will result. And, assuming that there is an accident, no one can predict with any accuracy whether the result will be a burn for the workman or whether fresh vapors will drift over to the fire, flash back and burn up the entire tank battery, while leaving the workman unharmed. We have no control, then, over the results of accidents. We can control the causes of unwanted occurrences.

Way of Living

The accident sequence technique is not new. It has proved its effectiveness for many companies. It is not a drive or a campaign—*it is a way of living*—systematically directed at preventing injuries and production upsets by identifying and controlling their causes. Line supervisors are the only ones who can determine the work methods which are to be followed. Accident prevention people can accomplish the greatest good by teaching line supervisors to analyze, pinpoint and eliminate the causes of accidents.

In this way we will reduce personal injuries with their accompanying human suffering and tragedy. But, additionally—controlling the causes of all unwanted occurrences—helps realize a reduction in all types of spoilage, damage and economic loss.

From an address delivered at the 40th National Safety Congress.

How To Use Sweatbands

TO GET the best results from cellulose sponge sweatbands, they should be moistened and squeezed dry before wearing them, according to the Safety Products Division of American Optical Company.

Their primary purpose is to prevent perspiration from bothering workers and impairing their efficiency by keeping it out of their eyes and away from spectacle and goggle lenses. However, when dampened before wearing, they actually absorb better and are more cooling and comfortable to the wearer, increasing efficiency during hot summer months and on hot jobs the year 'round. Placed against the skin when dry, cellulose sponge is not as comfortable and absorbs less than when slightly dampened before using.

Industrial Hygiene

Associate Editor
Jacob A. Goldberg, A.M., Ph.D.

Industrial Wastes

RECENTLY published is a 497-page book entitled *Industrial Wastes—Their Disposal & Treatment*, by William Rudolfs and bringing up to date the waste disposal problems of such industries as meat packing, leather, pulp and paper, coal, plating, dyeing, etc.

Each chapter is written by an expert in the particular industry, and the physical, chemical and biological factors for each type of problem are developed in detail. The volume brings together the latest information on the scope of the waste problem, the basic principles of stream pollution and self-purification, and methods of treatment. Recent advances are given special emphasis and the problem of radioactive waste disposal is also discussed.

The book should be of particular interest to engineers and chemists concerned with waste problems, municipal officials responsible for pollution control, and consulting engineers who design waste treatment plants. It is available for $9.50 from Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y.

Arthritis Victims Can Work

INDUSTRIAL physicians are beginning to accept arthritis victims as capable, steady workers, a conference of medical directors from nationwide chapters of the Arthritis and Rheumatism Foundation have learned.

Dr. Robert Manheimer, medical director of the New York chapter, speaking to 75 physicians and representatives of the foundation at the Waldorf Astoria, attributed part of this change of attitude to the "back-to-work" program of the local chapter.

"We are trying," Dr. Manheimer said, "to call to the attention of industrial physicians the fact that victims of arthritis are now good employment risks. Recent advances in medicine and techniques make it possible to greatly reduce work loss from rheumatoid disease."

A big step in this direction, he added, was made at a recent conference of industrial physicians in New York.

"Here," he said, "the doctors were able to get an up to the minute briefing on advances in the rheumatoid disease field. They could see for themselves why and how arthritic sufferers are now able to compete with other workers."

Dr. Manheimer pointed out that careful work must also be done with the patient to prepare him for work. The pain and crippling which so often accompany arthritis must be dealt with emotionally as well as physically. A sound program must make available both kinds of treatment in restoring arthritis victims to useful, productive lives.

Dr. James J. Lightbody, medical director of the Michigan chapter, said that a program of home care for needy arthritis patients had proven successful in giving the essential after care to arthritis patients. Dr. Willard G. Snow, member of the medical and scientific committee for California, reported an increase in special training for nurses in rheumatoid disease.

Standard Being Set for Ultrasonic Diathermy Machines

MANUFACTURERS of ultrasonic diathermy machines will be able to offer safer equipment of known performance characteristics based on American Standards now in process of development. Vice Admiral George F. Hussey, Jr., managing director of the

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- Historical and Legal Aspects
- Noise Reduction Unit
- Noise Reduction Education
- Noise Control Research

Historical And Legal Aspects Of The Noise Problem

By C. RICHARD WALMER, M.D.
Managing Director
Industrial Hygiene Foundation
Mellon Institute, Pittsburgh, Pa.

A STORM is brewing over the industrial horizon. The first scattered drops have been felt by a number of manufacturing companies and others are beginning to look uneasily at the gathering storm signals and to turn to the medical, technical and legal fields for forecasts. They are suddenly aware that compensation claims for occupational loss of hearing may rain down upon them, that recognition of the seriousness of the problem has come none too soon.

The doctors who have been asked to distinguish between occupational and nonoccupational loss of hearing and to establish the percentage of loss are cognizant of the complexities involved and of the lack of proved methods for determination. The engineers who are rushing against time to design instruments for the accurate measurement of noise know how much is yet to be accomplished. And the lawyers who have suddenly been faced with the problem of defending their companies against numerous compensation claims for occupational loss of hearing are deeply concerned about the implications that lie in test cases now before the Courts.

Time for Action

We can no longer say, "We'll worry about that tomorrow." Tomorrow is here. Already in the State of New Jersey compensation claims for occupational loss of hearing amounting to more than $5 million have been filed against one company alone. In Wisconsin, in a matter of a few months late in 1951 and early in 1952 some 40-odd cases originating in 2 drop forge plants were filed. There are from 25,000 to 100,000 potential cases in Wisconsin that are being held up pending determination of the State Supreme Court in a test case.

The claims for compensation already filed represent a new type. Claims are being made for compensation for loss of hearing even though no loss of earnings has been alleged. In the test case in Wisconsin, the Industrial Commission held that wage loss is not necessary because loss of hearing is a schedule injury in that state, along with such injuries as the loss of a hand, foot or other member of the body. That case also raises the question whether, under the Wisconsin statute, compensation is payable in occupational disease cases where the man is still in the employment which caused the disablement and has not terminated that particular employment. The Circuit Court reversed the decision and disallowed the claim. If the State Supreme Court should uphold such a definition, the mass of claims that could ensue in Wisconsin and in other states could run into many millions of dollars. The schedule benefits in Wisconsin, the highest, are $12,333 for total loss of hearing. In New Jersey the allowance is $6,000 and in Oregon it is $8,600.

A bill has been introduced to the Wisconsin State Legislature asking that hearing loss cases be put on a wage-loss basis. This remedial legislation has been

(Continued on page 35)

THE NOISE

Noise-Reducer

ONE of the largest noise reduction units ever constructed in this country is incorporated in Lever House, the new 24-story glass and steel headquarters of Lever Brothers Company in New York City.

The silencing system, installed in a louver 70 feet long and 15 feet high, quiets noise from 7 giant blowers in the air intake unit of the air conditioning system. The only comparable silencing system, in cross sectional area, has been constructed for jet engine test cells in the aircraft industry. The new installation has 1,000 square feet cross section, while jet engine test cells are about 900 square feet, although the latter handle a larger amount of air than the unit at Lever House.

The silencing unit handles an air intake of 200,000 cubic feet per minute. Engineers feared that uncontrolled, the blowers, which force air through the air conditioning system, would make so much noise as to disturb occupants of adjoining buildings. The problem was to reduce this noise to the ambient noise level of the neighborhood. Before the silencing system was designed and built a noise survey was made in the vicinity. It was necessary to take into consideration that the blowers operate from 7 A.M. to midnight. Inside the plenum chamber, a maximum noise level of about 100 decibels was recorded, while on a ledge of an apartment house 60 feet away, the sound level meter registered a maximum of 75 decibels with the ambient at times dropping to as low as 55 decibels.

Installation of acoustic panels for high frequency absorption and resonators for low frequency attenuation was one of the techniques used to reduce the noise level. After installation of the devices, it was impossible to pick up sounds from the blower by ear or electronic instruments. Installation itself created a unique problem, as the plenum chamber between the blowers and the louvers was only 6 feet deep and 2 feet had to be kept clear to allow access to the blowers, leaving only 48 inches for the panels.

Noise Reduction Course At MIT

A SPECIAL summer program in noise reduction will be given in the Acoustics Laboratory at the Massachusetts Institute of Technology from August 24 to September 4, according to Professor Ernest H. Huntress, Director of the M.I.T. Summer Session.

The program, designed to give engineers and scientists a working knowledge of means for noise reduction in industrial plants and in buildings, will be under the direction of Professor Leo L. Beranek, Associate Professor of Communications Engineering and Technical Director of the M.I.T. Acoustics Laboratory.

"The problem of noise reduction in industrial plants and buildings has skyrocketed to importance because of recent court decisions favorable toward workers with partial loss of hearing," Professor Beranek points out. "Simultaneously," he continues, "architects have found their clientele demanding quieter living and working conditions."

The Special Summer Program at M. I. T. will present methods of measuring a wide variety of noises, as well as techniques and materials for noise reduction. Lectures and demonstrations will cover the following topics: basic terminology and concepts, measurement of noise, psychological aspects, room acoustics theory, noise reduction in rooms, transmission of sound through structures, characteristics of noise sources, materials and structures for noise reduction, mufflers and vibration isolators, machinery and ventilation-system quieting.

Further information and application forms for the Special Summer Program in Noise Reduction may be obtained from the Director of the Summer Session, Room 3-107, Massachusetts Institute of Technology, Cambridge 39.

Rising Deafness in Industry Spurs ASA Noise Control Research

CLAIMS totaling $2 billion for deafness due to excessive industrial noise are in the courts today. Noise levels in cities and industrial areas are going up to a degree which may endanger the mental and physical well-being of individuals in the vicinity. Noisy machines in factories are creating a newly-recognized hazard—accidents resulting from warnings and instructions misunderstood or not heard. Sales resistance to noisy industrial equipment is also developing.

Current pressure from legislative bodies of the states and industry for standard criteria to assist in remedying these conditions has led to the initiation of a research program in the field of noise measurement and control by a subcommittee of the American Standards Association, Vice-Admiral George F. Hussey, Jr., managing director of ASA, announces.

Claims for compensation for loss of hearing due to industrial noise cannot be settled without adequate bases for determination of causes. Industrial noise limits cannot be set without a sufficient body of bio- and psycho-acoustic data. Noise abatement programs are ineffectual without sufficient scientific information regarding cause and effect. These data are not yet available.

Objective of the new research program will be to discover whether criteria for noise control can be established in the light of presently available bio- and psycho-acoustic data, and to publish such criteria for the use of those interested in industrial noise limits. In the furtherance of these objectives, the committee

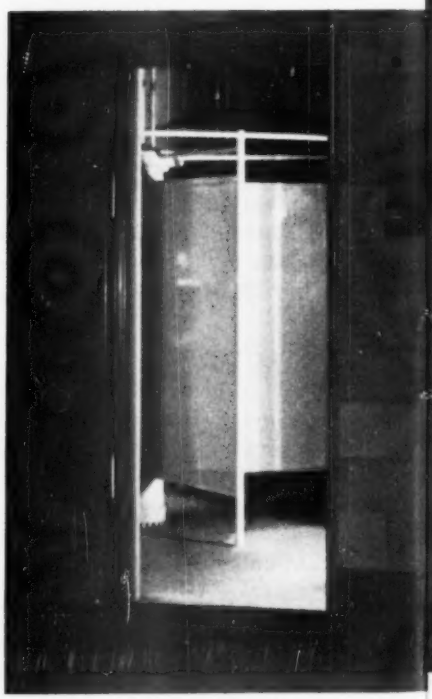
(Continued on page 38)

This change room uses lockerbaskets. Work clothes are stored in the baskets at ceiling level, to aerate the clothing and to save floor space. Each employee pulls clothes to ceiling by cable, then locks basket in place. Note how clear and simply cleaned the floor space is. There is no place for rubbish to collect and maintenance is easy and inexpensive.

CHANGE
MAKE A

PROPERLY designed change rooms not only protect the health and welfare of employees, but cut down labor turnover and promote better employee-employer relations. This has been proven many times, but plant and safety engineers, plant physicians and nurses, and personnel managers all seem to agree that the least attention has been given the planning of industrial change rooms of all the items entering into production.

Since change rooms have this important but ignored place in industry, their design and layout should be thoroughly investigated before remodeling and/or planning new ones. This article is not intended to be a thorough study of all the complex problems that enter into the design of a change room for each individual condition. It does, however, attempt to give the various standards that have been successfully used in modern change room design, and to point out the items that must be considered and included in practically all change rooms. In many states and localities change rooms are governed by local codes or laws. Be sure to consult your local code before remodeling or constructing anew.



Showers and washfountains in change rooms are two more ingredients of good worker-morale. Note as well the sanitary and restful tile walls and the simplicity of design which makes cleaning the floor and walls simply a matter of hosing down between the working shifts. Lighting is well-placed and pleasant, neither too bright nor too dark.

Location

Generally speaking, too little attention is given the location of the change room site, especially in regard to the main building. The site is too often selected because of favorable topography, an unused location on the plant grounds, or because of its convenience to the boiler plant. If the change room is located in a building of its own, it should be located as near the main working area as possible. Men dressed for indoor work should never be required to walk long distances in cold or wet weather without their outdoor clothing. In the

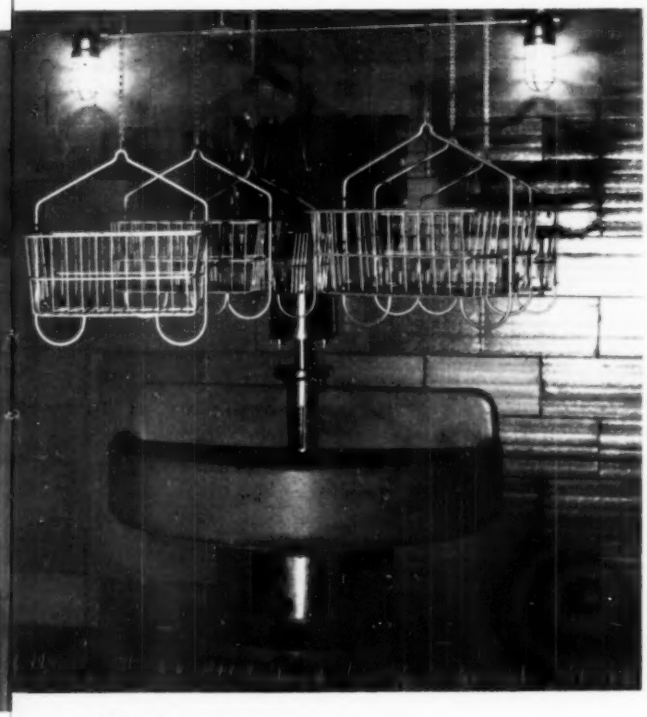
mining industry, for example, change houses are located as near the mine entrance as possible. The reduction in absenteeism has been appreciable, particularly in winter weather.

If the change room is somewhere within the main plant building, it should be as near the building entrance and exit as possible. Preferably, employees should be able to enter the change room from an uncongested area of the plant and leave directly to the outside. From the point of view of the plant manager, this is particularly important since it keeps employees who have finished their work from distracting working employees, as they leave. For ease of maintenance and economy of construction, it is advantageous to have one large central change house with complete shower and toilet facilities. If the plant has several stories or a number of widely scattered buildings, it is good practice to place limited toilet and washing facilities throughout the plant, so that no man will be required to walk more than 150 feet to a washroom. The man hours saved by proximity to work areas will soon pay for the cost of these auxiliary washrooms.

FEATURE

Third of a feature series on Plant Sanitation. Previous articles appeared in May and June issues.

ROOMS CAN DIFFERENCE



Floors and Walls

Concrete floors with a slight slope toward properly located drains have been found to be best for change rooms. A suggested slope is ¼ inch to the foot. It is customary to roughen the surface of the cement slightly or to sprinkle sand or carborundum over it before it sets, in order to avoid slipping. In many change rooms the concrete is covered with a layer of melted hot asphalt with a minimum thickness of 1 inch. Besides being a warm, pleasant surface for the feet, this flooring material is economical, water-proof and easy to replace. Copper oxychloride cement floor surfacing is often employed because it retards the growth of mold and bacteria, which are responsible for many skin infections.

Simple, adequate benches and clean floors, easily kept that way, help make this room a pleasant place for miner to change clothes.

Smooth, light-colored walls, employing a restful color-scheme will reduce employee fatigue. The wall should be easy to clean to a height of 7 feet (a maintenance man's reach) and the angle between walls and floor should be coved. Preferred materials for wall construction are tile, glazed brick, or waterproof cement.

Heating, Ventilation and Illumination

Proper heating of change rooms to protect the worker's health and afford him comfort is of extreme importance. The area in which employees bathe should be kept between 75 and 80 degrees F. the year round. In dressing areas a temperature of 68 degrees F. is

sufficient. It is recommended that either unit heaters be employed to induce heated air into the room from the ceiling or a steam or hot water system be used, with pipes carefully placed to prevent bodily contact. If pipes are near the floor level, effective screening must be used.

The entire locker room should be adequately ventilated, with a recommended 6 to 10 air changes an hour. If mechanical ventilation is employed, warm air should be introduced near the ceiling and exhausted near the floor in order to reduce dust and aid in circulating warm air over clothing suspended for airing. Natural ventilation should employ a combination of windows with the sills at least 7 feet from the ground and roof ventilators. The ventilators should be equipped with a manually operated damper and windows should be easily operated from the floor. In this way hot, humid air with odors from clothing can escape through the roof. Care should be taken to avoid drafts below shoulder level.

Illumination by daylight requires a window proportion of 1 square foot of glass to each 10 square feet of floor area. Best results in artificial illumination has been obtained by placing the lights on the side of the room, preferably on the long side. The ratio of the height of the lights to the width of the room should not exceed the ratio 1 to 3 to obtain the best illumination. If, however, a greater ratio is necessary overhead light should be used.

Traffic Flow

Particular attention should be given to the relationship between lockers, toilets, washfountains, showers and entrances and exits. Equipment should be placed so as to draw the user progressively through the change room, from entrance to exit with a minimum of confusion and unnecessary walking. Correct traffic flow will reduce the space required for the change room and will allow the employees to obtain maximum use of the facilities.

Clothes Storage

There are three common ways to store employee's clothes and personal effects: hooks or ladders hanging on the wall, in floor lockers, and in overhead basket lockers.

The first of these ways of storage is applicable only to the very small establishment. In plants of any size hooks have been eliminated because of the inability to control the location of individual clothes, lack of security to the individual, and because of failure to provide for storage of personal effects.

Experience has shown the steel locker to be satisfactory if it is mounted on a terrazzo or cement island, and fabricated with a steeply sloping top to prevent its use for shelf purposes. Special care must be taken to make sure the lockers are thoroughtly cleaned inside every 2 weeks to prevent accumulation of dirt and trash. A minimum of 4 feet should be allowed for aisle space between each row of lockers with integral benches and this must be increased to 6 feet if a separate bench is placed between the rows of lockers. It is highly recommended that a system of forced locker ventilation be installed to exhaust air from each individual locker. Otherwise unsanitary and unhealthy conditions will develop in the lockers, accompanied in all probability by objectionable odors.

Overhead storage has proven to be a most satisfactory method of handling clothes. The use of overhead storage baskets enables the floor area needed for the locker room to be cut down, more efficiently used, and more easily cleaned. Installation of baskets also is inexpensive since material cost is cut. Equally important is the fact that the basket storage idea allows clothes to aerate much better than other types of storage. Pilfering is cut down because thieves have no place to work unobserved and cannot reach personal effects. Offensive odors are removed, bacteria spread is checked and clothes are quickly dried because they are hanging loose in light as well as air. The maintenance of the change room can become chiefly a matter of hosing down floors and washing walls.

Benches

A sufficient number of benches should be provided to accommodate 30 to 50 percent of the personnel using the change room at any one time. Benches should be attached firmly to the floor to prevent shifting. Preferably, they should be made of smoothly finished wood, about 17 inches from the floor and 8 to 12 inches wide. When used in a room containing clothing baskets the benches should be placed along the rail on which the chains holding the baskets are locked. When the baskets are lowered they are then no more than 6 or 8 feet away from the benches.

Toilets

Generally speaking, the toilet rooms should be separated from the change room by a solid wall. Toilet fixtures should be provided in the ratio of 1 for 10 persons, 2 for 25 persons, 3 for 50 persons, 4 for 80 and 5 for 125 persons of each sex. For each additional 30 persons or fraction thereof one more fixture should be provided. Where urinals are provided, it is permissible to reduce the number of fixtures by the number of urinals, except that the number of toilet fixtures cannot be reduced to less than ⅔ of the total number of urinals and toilet fixtures required.

Lavatories and Washfountains

Washfountains are gradually becoming the most widely used industrial wash fixture, although lavatories and wash troughs are still used in many places. The

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(For further details, use Key # G-12 on free Inquiry Card on page 71)

washfountain provides great washing facilities in a small amount of space and cuts water waste besides saving on pipe connections.

Lavatories should be provided at the rate of one basin or 20-inch wash trough for every 10 employees. Washfountains should be 54-inch circular for 50 users, 36-inch circular for 30 users, 54-inch semi-circular for 30 users or 36-inch semi-circular for each 15 users.

Showers

Showers should be supplied in a ratio of one shower head for each 10 men on a shift, although industries in which dirt is not a major problem often employ ratios as high as 15 to one. This ratio is many times determined by local code, however, and the code should be consulted before reaching a decision. Most modern washrooms have shower stalls with one shower in each stall. Group showers offer no protection from splashing water from one shower to the other; it is difficult to control drafts in an open room system, and the likeliness of horse-play is increased. Temperature of the water must be regulated by a safety mixing valve to prevent the worker from inadvertently turning on extremely hot water that might cause severe burns.

Soaps

In their sanitary and labor codes some states now require the employer to furnish soap for the workers, and this practice is rapidly growing. Either powdered or liquid soap is usually furnished, depending on the conditions encountered in the individual plant. One of the many soap manufacturers will be glad to make an analysis of particular requirements and make recommendations. Workers seem to be about evenly divided in their preference for powdered or liquid soaps. In many plants the practice is to furnish both types, allowing the individual to make his own choice.

Drinking Fountains

A sufficient supply of clean, chilled, safe drinking water, preferably with the temperature not above 48 degrees should be made available in clothes storage and washrooms, but they should never be included in toilet rooms. It is recommended that one drinking fountain be supplied for about every 50 persons. Drinking fountains should also be provided with a stream of water of 65 to 70 degree slant to eliminate the possibility of drawing falling water back into the ascending

column, and yet not produce the hose-like force of a stream at a greater slant.

General Considerations

Entrances should be screened, insuring privacy, and doors should be self-closing. At least 2 exits should be provided. Adequate fire-fighting equipment should be available at all wash or change houses. Safety and announcement bulletin boards may be placed in a prominent place in the change room, where they are passed by all employees several times a day.

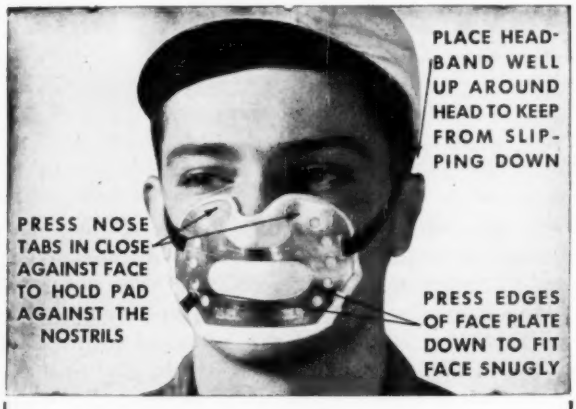
Athlete's foot presents a serious problem in all change rooms. The most common and successful method of control is to place a shallow container, mat or mechanical dispenser in the doorway between the shower and change room so it cannot be avoided or forgotten. A wide divergence of opinion exists as to the proper methods and chemicals. To best control this infection it is recommended that competent medical authorities be consulted before a final decision is reached on the particular method to use.

The change room should be cleaned thoroughly after each shift. Floor and lavatories should be cleaned with a hose, and wash fountains with a high-grade neutral soap without free acid. If the change room is of any size, it is recommended that a caretaker, trained in first-aid, be assigned to work in the change room on each shift. Plants tend to grow with a resulting increase in personnel. A well-planned change room will leave sufficient area for a later increase in facilities without expensive structural changes. Enough receptacles for waste should be placed around the change room to encourage maintaining neat, orderly premises at all times. If the change room entrance is from the outside, it is recommended that a trench, covered by open steel grating, be placed in front of the entrance. This will prevent tracking dirt and gravel into the change room.

A clean worker is a healthy happy one, and a happy worker is a good, steady efficient one. The intelligent placing, design and furnishing of industrial change rooms is perhaps one of the most direct and certain methods of increasing worker's morale. Don't neglect it.

Pictures and text by courtesy of The Moore Co.

For detailed descriptions of change, shower and washroom products see pages 243–283 of "Best's Safety and Maintenance Directory," 1952–53 edition.


PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
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(For further details, use Key # G-13 on free Inquiry Card on page 71)

Maintenance Accidents

(Continued from page 25)

or installed machinery—with a minimum of disturbance or displacement.

The working platform should be big enough to do any job required. One type of platform is 2 feet, 4 inches by 5 feet, 11 inches. Each platform unit comes in 5 parts for assembly; including ladders, platform support trusses, and the platform of metal-bound plywood. Loose parts have been eliminated (such as bolts and nuts). Upright ladder sections are a part of each scaffold and are used at each end. Platform support trusses are also interchangeable, and the platforms will support up to 800 pounds in all positions.

Still larger platform areas can be procured if needed. Casters make scaffolding and platforms more flexible and give valuable mobility. The new type scaffolds can be easily built up, unit by unit, to reach high places. Each unit locks to the other, providing a safe, sturdy scaffold on which several men may work at the same time. Men should also be able to work at different levels of the stack or scaffold. After assembling the first unit of the new sectional scaffolds, the placing of the remaining units is easy. One type of unit, for example, with slotted ends of the ladder sections on the outside, and with dowel ends upward, permits subsequent ladder sections to be placed over the dowels in the top of the assembled ladder sections.

When stacking 3 or more units high, additional stacks of scaffolding are needed. Stocks are tied together with tying trusses. For work that requires a large working area such as painting, plastering and wall-washing, the new scaffolds may be assembled side by side.

All the factors which have been discussed and the increasing ceiling height of buildings make dependable and effective scaffolding a must in the modern building or plant.

Pictures by courtesy of Baker-Roos Inc.

History of Noise (Cont'd from page 28)

agreed to by representatives of labor and industry. Under this bill, as introduced, compensation would not be payable for occupational hearing loss unless there was a wage loss, and the maximum benefits would be set at $3,500. This bill, if passed, would establish a definite basis in Wisconsin on which claims for hearing loss could be settled or established. This situation, of course, would not necessarily be true in other states. That the present scare is not just an alarm is amply demonstrated by this agitation for standards and for new compensation laws.

Consider what could happen in New York State, which has 6 million workers, 10 percent of whom, or 600 thousand are potential claimants for compensation due to loss of hearing. At $2,000 each—the compulsory reserve fund—this could mean more than $1 billion in claims in the state of New York alone! In addition to this possibility, there is nothing to prevent a man from suing again later for further loss of hearing, or from claiming a higher percentage of disability if a second injury of another nature is suffered.

Parallels Silicosis Problem

It is disturbing even to think of the similarity between the storm warnings building up around the noise problem today and the rumblings that preceded the silicosis "earthquake" in the early 1930's. Scattered investigations of pulmonary dust diseases had been made, particularly in the hard-rock mining industry, before 1930. But no one was prepared for the cloudburst that hit our country in 1933. It was precipitated by the widespread attention given to the silicosis contracted by workers during construction of a tunnel at Gauley Bridge, West Virginia. Damage suits multiplied by the hundreds. Courts, juries and physicians knew so little about the disease they often made awards to men who had never even been exposed. Damage suits were filed against cement companies and against mining companies whose operations were in limestone formations where there could be no possibility of silicosis hazard. . . . Lawsuits were aided by almost total ignorance of industry and by absence of silicosis in compensation schedules which enabled suits to be brought for amounts far in excess of limits of compensation. . . . It was a medico-legal phenomenon of a scope and intensity that was preposterous and almost unbelievable. Damage suits, under the common law, totaled in excess of $100 million.

Noise is almost synonymous with factory. That means hardly an industry would be unsinged by litigation once the spark is really set off. In this day of increased workmen's compensation benefits, lawsuits would spread like a forest fire and soon be out of control. Ever since the Industrial Revolution, noise has been accepted as the necessary accompaniment to production. The hum of the shuttle, the ring of steel against steel, the crash of hammers, admittedly harsh music, nevertheless have pleasant overtones because they mean production is going full steam ahead. But discordant undertones are making themselves heard. They have been present in the form of increased absenteeism, higher accident rates, lowered production and high labor turnover; but management has been too engrossed with other pressing problems to be fully aware that a serious noise problem exists. Oftentimes, quiet has been sacrificed in order to lower the cost when designing equipment or for seemingly less expensive production methods. That is false economy. The workmen don't have to grin and bear it any longer.

The task is not easy. If it were, industry probably would have faced it long ago. The problem is complicated by the fact that people are exposed to numerous sources of noise other than in manufacturing. How are we to distinguish between occupational and nonoccupational loss of hearing? Loss of hearing is a normal aging process, but there is no set pattern to serve as a measuring guide in weighing this factor. Toxemias, drugs and debilitating diseases may take their toll of hearing ability. Where does one contributing factor begin and end? Where does it overlap? We need to be able to distinguish between temporary and permanent deafness and to analyze human responses which result in emotional and fatigue states. Individual susceptibility enters into every study of the effect of noise on man. A method for measuring the effect of noise on the nervous system is far from being in our grasp.

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INDUSTRIAL PRODUCTS COMPANY
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(For further details, use Key # G-14 on free Inquiry Card on page 71)

The noise problem exists because of the effects which noise has on man. It is natural, therefore, to place emphasis on the medical phase in order to obtain a clear-cut evaluation of these effects. But the physician cannot even begin to correlate the various levels of noise with their effects on hearing unless his studies are integrated with those of the physicist and the engineer. Noise must be measured before its effects can be studied. Measuring techniques now in use are not adequate. Present instruments, such as the sound level meter, provide only meager information. Auxiliary equipment at present available for analyzing noise intensity levels in the various frequency bands provides more information, but much still remains to be done in the development of instruments and measuring techniques before sufficient data can be compiled to guide industry expertly in applying control measures.

A standard technique must be established also for reliable and practical measurements of hearing impairment. Specific related problems must be studied, such as the effect of vibration upon hearing and the development of tests which might predict which individuals are unusually susceptible to hearing impairment. Consideration must be given to all aspects of placement of such applicants and also of these employees who already have hearing impairments.

Once measurements can be made accurately, the relative effects of such functions as intensity, frequency and intermittency or duration must be evaluated and methods developed for weighing the relative significance of these physical factors.

Once it is clear what kinds of noise cause damage to the ear, the engineers can go on to the next step—control measures. They must design quieter machinery and revise operating methods so as to reduce noise in the working environment. This is an expensive step, but cheap in the long run.

The Legal Aspect

The lawyer's job is to hold his finger in the dike until the confusion that surrounds the compensability of occupational hearing loss can be dispelled. The attorney needs "sandbags" of evidence to support his defense of industry against unjust lawsuits. He needs behind him conclusive medical reports and authoritative statistics based on extensive research so that he can throw his weight against irrational compensation laws that may flood the states without any degree of uniformity or fairness.

The big question is, what are the permissible noise levels? There is too much variability in the opinions of those who have studied the problem thus far. Governmental codes based on present tentative standards would have a shaky and dangerous foundation. Further study and exhaustive testing of proposed standards must be carried out before any standards are permanently established.

The urgent need for a prompt and comprehensive study of the problem of noise in industry is indeed evident. Recognizing the fact that unless there is close cooperation and coordination of research, much time and money will be dissipated in a frantic effort to "beat the clock," representatives of a number of interested groups have asked Industrial Hygiene Foundation to participate as a coordinating agency in a broad and comprehensive program designed to provide as soon as possible, practical information which can be used for developing control measures and for establishing regulations which will be equitable and practical.

The first objective of the program must be to find and define basic criteria which are necessary for the appraisal of the effects of noise on hearing. Other important primary objectives are: to establish a correlation between loss of hearing and exposures to noise intensity levels in the various frequency bands; to evolve control procedures to reduce noise to acceptable levels; and to develop evidence which may lead to the establishment of fair and equitable regulations for coping with the legal aspects of the problem.

Several national groups and insurance organizations are devoting time to the noise problem. The National Bureau of Standards has published reports on the transmission of sound through wall and floor structures, sound absorption of building materials and soundproof partitions.

Important as all this research has been, each little bit, standing alone, is not significant enough to make any outstanding contribution. It must all be brought together and studied thoroughly as a whole, and industry must take a much more active part in future research.

Headlines in the Making

Noise in industry has been hidden in the shadows long enough. Many company officers feel very remiss about waiting until the spotlight is turned on to do something about it. It took public attention to accomplish the introduction of a nonpoisonous phosphorus compound, the sesquisulfide, to replace white phosphorus which was used in the manufacture of "lucifer" matches. Poisoning caused by luminous paint containing radium used on clock dials in the early 1930's was eliminated by the same public scrutiny. Attention was focused on hazardous materials when 100 people died in the Cleveland Clinic Fire in 1929 because of decomposition of materials not themselves hazardous. In this case it was nitrocellulose x-ray films, which gave off oxides of nitrogen as they burned. Certainly the Donora smog episode is not to be overlooked as the prodding instrument that gave great impetus to the study of air pollution and its effects on human beings.

But industrial noise is going to make greater headlines than all of the other incidents put together. It is up to industry whether those headlines will spell trouble or even disaster for many companies or whether they will be a banner proclaiming the fact that management really is deeply concerned with providing healthful working conditions for its greatest asset—the men and women in its plants.

The Industrial Nurse

Editor
Rosamond J. Webster
R.N., A.M., Ph.D.

What Is Public Health?

INDUSTRIAL nurses have varying responsibilities in the field of public health. Many have opportunities to render real service in this area; but, because of limited training and experience, are unaware of the possibilities that are theirs in industrial hygiene or industrial nursing posts. Others are employed in such work, even though they may not be particularly concerned as to the professional label that may be applied to their day-to-day services.

The term "public health" has been adequately defined by a distinguished leader and educator as "the science and art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing services for the early diagnoses and preventive treatment of disease, and the development of the social machinery which will assure to every individual in the community a standard of living adequate to maintain health." This is a long but inclusive definition of a field of human endeavor which affects the lives of all.

Whether the industrial nurse is primarily interested in sanitation, preventive medicine, curative medicine, health promotion, health education, or improvement in the standard of living—this broad definition covers them all. It can serve as a guide to the many opportunities for educational and preventive services that are available to industrial nurses.

Lack of knowledge, lack of personal stimulus, lack of encouragement by immediate superiors are not good reasons for standing still. Referring back to this definition an industrial nurse can find enough to challenge her in any job she may hold in any part of the country.

Good Nutrition

THE worker who starts the day with a good breakfast, instead of a cup of coffee and a cigarette, is prepared to do a good job. Protective foods are essential for maintaining health and physical vigor. In view of the comparatively high wages that are now being paid in most industries and commercial establishments and the liberal policies on absenteeism, it is essential to keep as many workers on the job as possible. Deficient nutrition may be the forerunner of various complaints, disabilities and severe illnesses. Therefore, it is essential to provide a good nutrition program in every plant in which an industrial nurse is employed.

Workers in small plants also need the assistance and information provided by the professionally-trained person. Unfortunately, no effective plan has as yet been developed to cover the millions of men and women employed in plants and businesses too small to warrant the employment of an industrial nurse.

The nutrition education program will depend on whether or not the particular establishment provides cafeteria or other food service. Where this is not the case, the workers have to be reached directly by pamphlets, posters or movies (when time permits, such as in the lunch period) and personal advice. Where food is prepared and sold to workers or provided without cost, as in some insurance companies, the problem of nutrition education is somewhat easier. A trained nutritionist will know what to provide on the basis of essential, protective and healthful food combinations. Where it is not possible to have such a person on the staff, the nurse and the plant physician can work out the menus and make all decisions in the matter of food selections.

In any event, an educational program should accompany the service of foods, so that the deliberately undernourished, those who do not select proper foods and those who are attempting to reduce—all of these will be induced to eat the kinds of foods that will help to keep them well and effective workers.

Extra Poundage

IF OBESITY can be classed as being hazardous at any particular time, perhaps the hot summer months have a strong claim. That is why the coming weeks and months are suitable for special educational efforts on the part of industrial nurses to recommend suitable summer-time luncheons and dinners—salads, non-alcoholic beverages and the like.

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Obesity is prevalent throughout the world, occurring even in countries where food is scarce and nutritional status low. In the United States, according to the Journal of the A.M.A. (May 2, 1953, p. 42) it is the gravest known effect of malnutrition. Insurance records indicate that a quarter of the adult population is obese—that is, sufficiently overweight to impair health. Mortality for this group is well above normal at every age and rises with increasing weight, according to recent insurance company estimates. Obesity is associated with a high mortality from cardiovascular-renal disease, diabetes, childbirth, and diseases of the liver and gallbladder. Deaths from diabetes are more than 3 times as common in the obese as in persons of average weight, and deaths from cirrhosis of the liver, among men, more than twice as common. The overweight also have an excessive evidence of hernia, urinary impairments, and some forms of arthritis.

Careful long-term studies indicate that drugs such as thyroid substance and appetite depressants are of little or no ultimate value, since only new eating habits and a reduction of intake can effect a lasting result. Obese persons eat more than their bodies require for the maintenance of good health. There are recognized psychological factors among those who consistently overeat. But, whatever the personal factors may be, bringing the simple facts to the attention of overweight workers and helping them to develop good eating habits, is a service all industrial nurses can render. The setting of good examples in company cafeterias can also be of some help.

Noise Control Research (Cont'd from page 29)

will study the reliability and statistical significance of various sets of industrial data and data existing in governmental and university laboratories. It will review the methods of measurement by means of which these have been obtained and endeavor to establish recommended noise limits for specific locations and conditions.

Assistance to governmental, industrial and medical groups and allied fields in setting up safe limits of industrial noise, in a manner to protect hearing, will be the primary accomplishment of the research. The avoidance of medical and legal complications associated with the noise hazards of modern industrial and military equipment and establishments will also be one of the desired results. The findings of the subcomittee will be published in the form of a Proposed American Standard, which will be given wide circulation for the purpose of receiving criticism. The approved American Standard on this subject will not be published until a consensus of all those concerned is definitely established.

The ASA Committee on Acoustical Measurements and Terminology, Z24, of which the subcommittee to undertake these investigations is a part, has been working for many years on problems of noise measurement. In 1936 it developed standards for sound level meters for the measurements of noise and other sounds, as well as a standard on noise measurement. These standards have been revised and related ones have been prepared since then. In their present form, these standards are: American Standard Noise Measurement, Z24.2–1942; American Standard Sound Level Meters for Measurement of Noise and Other Sounds, Z24.3–1944; American Standard Test Code for Apparatus Noise Measurement, Z24.7–1950; American Standard Specification for Audiometers for General Diagnostic Purposes, Z24.5–1951; American Standard Specification for an Octave-Band Filter Set for the Analysis of Noise and Other Sounds, Z24.10–1953; American Standard Specification for Pure-Tone Audiometers for Screening Purposes, Z24.12–1952.

Ultrasonic Diathermy (Cont'd from page 27)

American Standards Association, has announced that the ASA had undertaken the project in the public interest.

Ultrasonic diathermy is the therapeutic heating of body tissues, and it is used increasingly in the treatment of such conditions as arthritis, rheumatism, sinusitis, neuritis, and various inflammations. In ultrasonic diathermy, the therapeutic heat is caused by means of extremely high frequency sound waves rather than the more familiar use of a high frequency electrical field.

Extreme urgency due to the danger of accidental

overdoses in treatment prompted the ASA Committee on Acoustical Measurement and Terminology to set up a writing group to start work on the standards.

The Food and Drug Administration requested that standards be developed in this field in order that the manufacturer, the physician, and the patient might be protected with equipment conforming to nationally recognized standards for safe performance.

Dr. T. F. Hueter, Acoustics Laboratory of the Massachusetts Institute of Technology, Cambridge, Massachusetts, and Dr. David E. Goldman, Navy Medical Research Institute of the National Naval Medical Center, Bethesda, Maryland, have been named co-chairmen to organize the work. Physicians, manufacturers of diathermy equipment, scientists, and acoustical experts are all represented on the committee.

The program of work outlined by the ASA committee is based on recommendations of the Food and Drug Administration to give particular attention to acoustic output of the machines, methods of use, the design of test equipment and the methods of its use, and the avoidance of interference with neighborhood radio and television reception.

Chicago Convention

INDUSTRIAL representatives and safety, fire and hygiene authorities of the Chicago area, Illinois, Indiana and Southern Wisconsin, gathered at the Conrad Hilton Hotel to discuss mutual problems of accident prevention early last month. The three day session would have been the 30th Annual Midwest Safety Show, but this year assumed the new title of the Greater Chicago Safety Convention and Exposition.

Manufacturers of safety and maintenance products displayed recent developments and the newest models of their products and equipment in the safety exhibit rooms during the first two days of the conference.

At the conference sessions themselves, safety problems and developments were discussed by experts in the field and by the delegates in panel and discussion groups. Among the topics covered were: Control of Hazardous Chemicals, Civil Defense, Safety in Confectionery & Baking Plants, Gas & Electricity, Maintaining Interest in Safety, Insurance Engineering, School Shop Safety, Office & Store Safety, Materials Handling, The Foreman's Role, Fire Prevention, Inspections, Plant Protection, Petroleum Safety, Safety Training, Small Plant Safety, Industrial Hygiene, Large Plant Safety, Construction Safety, Motor Fleet Safety, Meat Packing, Industrial Nursing, Human Relations in Safety, and Traffic Safety.

John J. Ahern, director of the fire protection and safety engineering department at Illinois Institute of Technology was re-elected president of the Greater Chicago Safety Council for the coming year.

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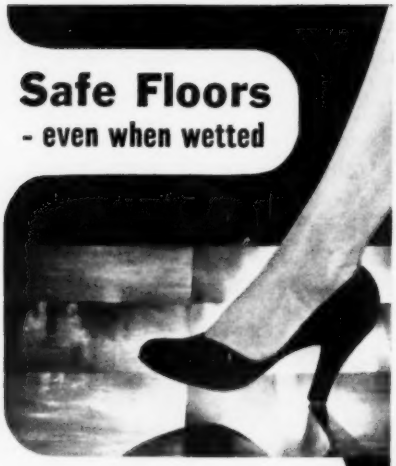

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SAFETY ACHIEVEMENTS

THE petroleum industry's safety record in 1952 was its best in history, a survey of accident statistics by the American Petroleum Institute shows.

The frequency rate of injuries for the industry as a whole declined to 9.67 per 1,000,000 man-hours worked. This is the first time this index ever has dropped below the level of 10. The previous all-time low for the frequency rate was in 1950—10.08 per 1,000,000 man-hours worked.

The severity rate, that is the number of shift-days lost per injury, dropped to 1.04 per 1,000 man-hours worked in 1952. This is substantially under 1951's mark of 1.29 per 1,000 man-hours, but still is somewhat higher than 1950's record of 0.84.

The survey for 1952 was based on the collective experience of almost 300 oil companies and their subsidiaries, employing 516,180 persons and involving total exposure of more than one billion man-hours.

THE injury rate in the nation's atomic energy program decreased by one-third in 1952, the U. S. Atomic Energy Commission announces. Injuries in the program during 1952 occurred at a rate of 2.51 per million employee-hours—33.3 percent below the 1951 figure.

A breakdown of the 1952 safety figures shows—(1) Operations contractors in the atomic energy program set a rate of 2.29 employees injured per million man-hours, compared to 2.69 in 1951. The 1951 rate for the chemical industry, the nearest comparable, was 5.48. (2) With an 80 percent increase in construction man-hours in 1952, workers incurred a construction injury rate of 2.71, which was 47 percent lower than the 1951 rate. The NSC rate for all 1951 construction was 20.92. (3) AEC direct employees had 1.96 injuries per million man-hours in 1952, compared with 1.95 in 1951. The rate for all Federal civilian employees for 1951, issued by the Bureau of Employees' Compensation, Department of Labor, was 8.4. (4) The rate for Government-owned motor vehicles was 1.4 accidents per 100,000 miles driven by employees of AEC and its contractors in 1952, compared with 1.6 in 1951. (5) Fatalities likewise were reduced, dropping from 24 in 1951 to 11 in 1952. None was due to radiation. Nine occurred in construction, one in a motor vehicle accident, and one in loading. The program rate for fatal injuries was 7.6 per 100,000 workers in 1952, compared to 23.2 in 1951. The rate for all U. S. industry in 1951 was 27. (6) Industrial fire losses of Federal property in the atomic energy field increased to $448,236 in 1952 against $38,318 in 1951. Two fires accounted for $362,000 damage. The 1952 fire loss was 1½ cents per $100 of property held. Improved-risk industrial properties nationally had a loss rate of 24/5 cents in 1951.

Important contributors to the personnel safety record of the atomic energy program are 30 contractors and 3 AEC field offices which have worked without disabling an employee in the past two years. In addition, 12 atomic energy contractors and one AEC field office have been declared winners of the 1952 AEC Safety Contest, an annual feature of the safety program. Asso-

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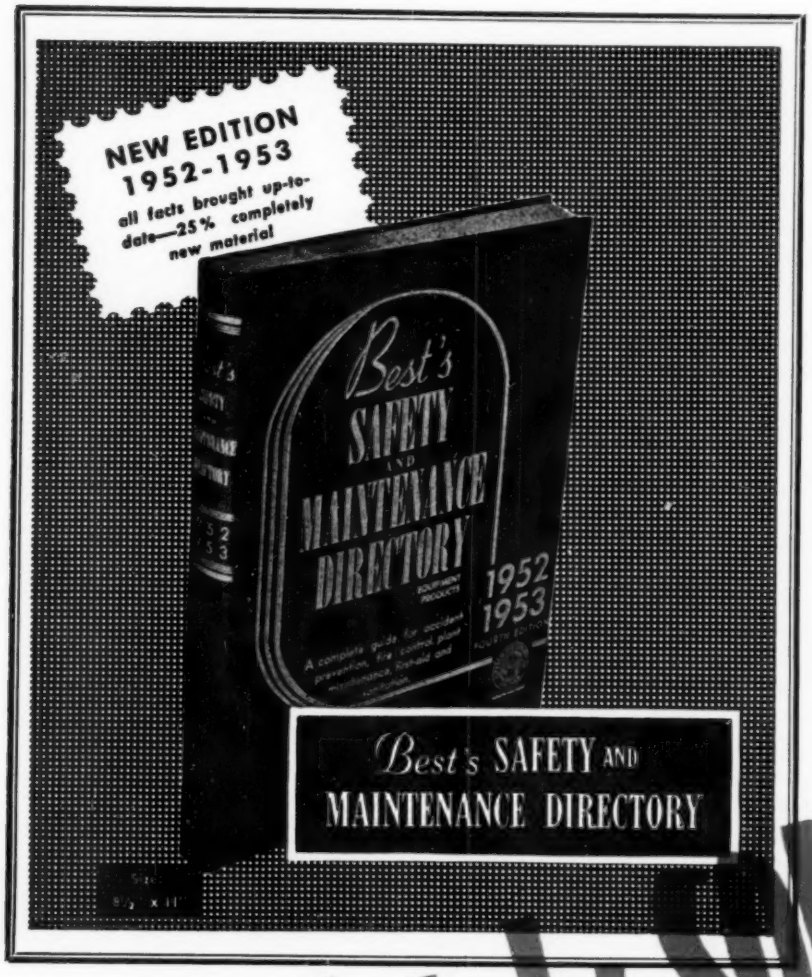

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adds the most important new safety information of the century—a whole new section on RADIATION PROTECTION—covering materials . . . methods . . . equipment.

Single copies $5.00
(Quantity rates available)

Orders now being taken for the new 1954-1955 edition to be published late in the fall of 1953.

ALFRED M. BEST COMPANY, INC.
75 FULTON STREET, NEW YORK 38, N. Y.

(For further details, use Key # G-18 on free Inquiry Card on page 71)

LASTS LONGER — May be used again and again —

BECAUSE, it's not made from cheap cotton, but Dupont's cellulose sponge with countless tiny pores to cool by evaporation.

Cheapest in the Long Run!

WORKERS praise its comfort features. Sweat doesn't fog glasses or goggles . . . doesn't get into eyes and smart!

PLANT MANAGERS are delighted when production goes up as much as 10% in hottest summer weather.

SAFETY ENGINEERS talk about evaporation cooling the whole body because the pores of sponge cellulose act like a wick. Drybrow holds 20 times its weight of water! No wonder it's the Nation's Sweat Band! — praised by every user.

FREE!
TRY A DRYBROW AT OUR EXPENSE

STOP THESE ANNOYING DROPS OF SWEAT!

Wearing a Drybrow is the next best thing to a cool shower. Evaporation of perspiration through thousands of cellulose sponge pores cools as nothing else can. Try one and be convinced. Sample sent FREE; or order 1 to 39 boxes at $4 each or $3.50 a box for 40 or more. (Each box contains 25 of the famous Drybrow Sweatbands.)

American Allsafe Co., Inc.
1246 Niagara St. • Buffalo 13, N. Y.
Use Key # G-19 on Inquiry Card on page 71

ciated Universities, Inc., operating the Brookhaven National Laboratory, New York, headed the list of larger operations contractors by reducing its injury rates 79 percent below its 1951 rates. E. I. du Pont de Nemours & Co. had no employees with disabling injuries at the Newport, Indiana, plant to win in Group II Operations, while American Industrial Transport, Oak Ridge, Tennessee; Columbia University, New York City; Harshaw Chemical Co., Cleveland, Ohio; and University of California, Los Angeles, tied for first place in Group III with no-injury records.

E. I. du Pont de Nemours & Co. also won first place among Group I construction contractors with a 75 percent reduction in rates for its Aiken, South Carolina, work. Topping Group II was Robert E. McKee, Inc., Los Alamos, New Mexico, with 55 percent improvement. The Hanford Operations Office, Richland, Washington, in competition with other AEC offices, won first place with a no-injury record for 1952.

THE employees of Hiram Walker's Peoria, Illinois plants have completed 1,125,000 man-hours of operations without a lost-time accident.

FOR the second time in 4 years, the Trailmobile Tank Truck-Trailer Trophy for the nation's outstanding record for safety and courtesy on the highways has been won by the Dan Dugan Oil Transport Company, of Sioux Falls, South Dakota.

The Dugan company's drivers are instructed to render assistance to motorists in trouble, are given equipment such as first aid kits, shovels, tow chains and other material with which to render it and are given training to enable them to render the best possible assistance. All drivers are given first aid and fire-fighting training, in addition to their regular driver training. The Dugan Company also brings safety messages to the general public through regular radio programs, newspaper advertisements and general and industry news releases concerning safety. Speakers are provided to talk about safety to civic clubs or any other interested groups.

The Dugan Company was the winner of the Trailmobile Trophy in 1949. Since then it was won in 1950 and 1951 by the Ruan Transport Corporation, of Des Moines, Iowa. The carrier who wins it three times is entitled to permanent possession of it.

DRAVO Corporation has won a National Safety Council Award of Honor for its 1952 accident prevention record which was 50 percent better than its previous 3-year average and the 3-year average of the industry. During 1952, Dravo experienced only one lost-time accident for every 161,351 man-hours worked, according to G. O. Griffin, Director of Safety for the corporation. It was the second best year for safety in the company's 62-year history.

The award was one of the first company-wide Awards of Honor ever given by the National Safety Council to a firm in the heavy construction industry. In addition to the company-wide award, the Neville Island shipyard also has won first place in the National Safety Council's Marine Section safety contest. The Neville Island record was best of 15 private heavy shipyards entered in the contest. The company's Wilmington, Delaware shipyard was tied for first place in the contest among light shipbuilding yards.

EMPLOYEES at the Old Forester plant and office of Brown-Forman Distillers Corporation recently heard the plant whistle signal that they had completed a million man hours without a lost-time accident. The no lost-time accident figure, compiled between December 19, 1951 and April 10, 1953, was celebrated by 3 blasts on the boiler room whistle.

TRANSPORTATION SAFETY

Traffic Safety Booklet

A NEW traffic safety booklet, "Common Sense Pays Off," which lists tips for safer driving has been issued by the Association of Casualty and Surety Companies to stimulate interest of both youthful and adult drivers in safe driving practices.

Illustrated with cartoons and charts, the booklet urges drivers to recognize their responsibilities and "use common sense while driving to avoid accidents," pointing out that skillful drivers are safe drivers. It then develops that skillful drivers drive at safe speed, yield the right-of-way, know and observe traffic rules, "expect the unexpected," steer clear of "tavern fog," heed the "signs of life" in highway warning and regulatory signs, and keep the car in good shape for their own safety and the safety of others.

Prepared by the Association's Accident Prevention Department, the booklet can be obtained from the Association, 60 John Street, New York 38, N. Y., or any of its member companies.

Car Check Program Goes After Accidents

AN ACCIDENT can happen to the best driver if his car is not kept in safe operating condition," W. F. Hufstader, Chairman, Inter-Industry Highway Safety Committee, and vice president of General Motors, said in announcing industry and dealer support of the annual "Check Your Car—Check Accidents" program recently conducted.

"One of every 3 vehicles 'safety-checked' during last year's program needed service attention for safe operation," Mr. Hufstader added. "This voluntary spot check was made of more than one-half million vehicles by the nation's new car and truck dealers. Americans want the freedom of movement automobiles provide. However, such freedom of movement calls for individual responsibility in exercising safe driving habits and maintaining vehicles in safe operating condition.

"On the basis of 1952 'safety-check' results it could be estimated that more than 17½ million of the nation's 53 million registered vehicles are in need of service attention to parts affecting safe operation. These parts include: brakes, front lights, rear lights, steering, tires, exhaust system, glass, windshield wipers, rear view mirror, and horn. Any or all of these parts can be important to every motorist in both long-range and short-range driving.

"With a current 4 percent increase in traffic deaths over last year," Mr. Hufstader stated, "it is obvious that periodic 'safety-checks' of all vehicles should be made. Particular attention should be given to the condition of brakes and lights. During the 1952 spot-check, brakes in need of maintenance attention were found in one out of every 7 vehicles checked. Front lights were reported in need of attention in one out of 12 cases and rear lights in one out of 14."

The annual "Safety-Check" program is sponsored by the National Safety Council as a part of their continuing "Operation Safety" activity. Cooperation of the automobile and tire manufacturers, their dealers, and the National Automobile Dealers Association is coordinated by the Inter-Industry Highway Safety Committee. Results of the 1953 voluntary "safety-check" will again be tabulated by the Inter-Industry Committee following conclusion of the program.

Trucking Safety Record Continues 5 Year Rise

THE trucking industry's safety record has improved steadily in the past 5 years despite increased mileage and exposure according to G. D. Sontheimer, safety director of the American Trucking Associations, Inc.

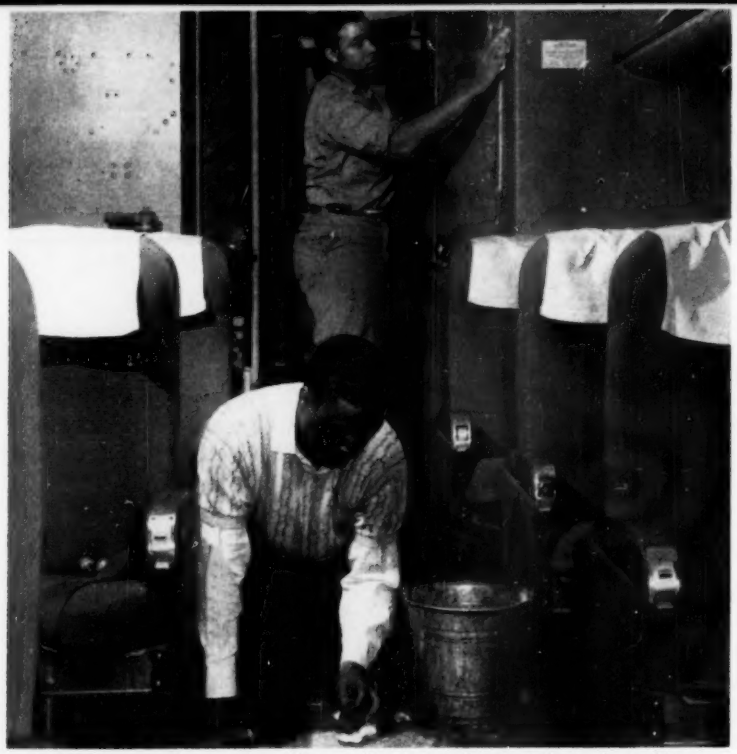
Mr. Sontheimer, of Washington, D. C., says the number of trucks involved in accidents has dropped 3 percent since 1948, to 14 percent, while truck registrations have declined only from 18 to 17 percent of all vehicles. During the same time, passenger cars increased in percentage of all vehicles by only 1 percent but in accident involvement by 4 percent.

He predicts even greater progress in the accident-prevention field "if an annual analysis of the safety program in each fleet is the rule." He adds that "fleets that depend on the same safety program from year to year, without analyzing to determine what changes are needed to meet changing conditions, will fall behind in their safety records."

Calling for "changes in our methods of engineering for safety," Mr. Sontheimer says the fleet safety engineer "must take a new look at his job" and "turn more of his attention" to the solution of non-traffic accidents. He defines the latter as those occurring on private property and more properly falling into the classification of "industrial acci-

(Continued on page 48)

CLEA



Maintenance employees give airliner walls, seats and carpet thorough scrubbing.

Thorough soap and water grooming after each run is given passenger car interior.

The floor of an automobile, whether carpet or rubber, needs soap and water care.

CLEAN vehicles — whether planes, trains or cars—not only go faster, but they also use less fuel, last longer, look better—and are safer.

The effect of dirt on performance is most pronounced in planes, where weight and wind resistance are major obstacles. For this reason cleanliness is a top-priority maintenance item with all major airlines, with whom the old saying about "cleanliness is next to godliness" has both literal and figurative application.

Just how are modern sky chariots cleaned and how does cleaning help them?

SAF

When a plane is crossing the continent, it receives cleaning attention to some degree at every stop. If it is a through station, the plane is swept, refuse removed, buffets cleaned, and the lavatories sterilized. When there is more time, the plane is given a more thorough cleaning. The job may take as much as 3 or 4 days when the plane is overhauled or given its periodic maintenance check.

Vice president J. A. Herlihy, in charge of engineering and maintenance for United Airlines, points out that "such attention provides a more saleable service and assists in

FAST

INSIDE- A

NER . . .

maintaining high standards of maintenance, particularly by the prevention of corrosion."

He adds that it is not only the obvious appeal to passengers which makes airlines devote so much time and money to keeping their fleets clean. Data compiled through experimentation with wind tunnel equipment, supplemented with actual experience of racing fighter planes, supply evidence that a clean plane will fly faster than a grimy one —not because of the added weight but because dirt on the wings could change the air flow and slow the plane.

Fuselage is covered with lather, mops agitate the suds and the plane is hosed down.

ER . . .

Military experts report that planes are slowed down during the fly season when swarms of the bugs adhere to the leading edge of wings changing the air flow and causing drag. During World War II, it was learned that camouflage paint had the same effect and the practice was discontinued. Drag on the plane also increases fuel consumption in much the same manner that an automobile demands more gas when it pulls a trailer.

Spokesmen for all major airlines are agreed that dirt has similar effect on their planes. American Airlines has found that cleaning enabled

Railroads use long-handled brush technique on windows and outside of passenger cars.

ER! . . .

ND-OUT!

Car lasts longer and performs better with a regular all-over shampooing and rinse-off.

planes to fly faster, save fuel, decrease corrosion and speed inspection. A clean plane will use less fuel because there will be less wind resistance resulting in less thrust, which determines the speed of an airplane.

Soap per Plane

Corrosion is a particular danger to planes because of the new alloys used in the building of aircraft. These alloys are especially susceptible to corrosive influences and dirt is one of the major contributing factors to such corrosion.

The vice president in charge of engineering at Eastern Airlines adds the observation that with high-speed, streamlined wing sections, it is imperative that the exterior of these wing sections, particularly the upper surface, be kept absolutely clean and free from any dents or protuberances of any kind. This is not because of wind resistance "but because with laminar flow wings, any disturbance of such flow will cause a reduction in lift."

Soaps and detergents, with the usual cleaning tools, are used in cleaning airplanes. One commercial air base at San Francisco used more than 47,000 gallons alone during 1952 of one type of a special detergent—16 gallons of it being used per plane. This cleansing agent is sprayed on the plane and is agitated by brushes. The washing crew then sprays water over the craft under 100 pounds pressure to wash the dirt away. In rare cases, when a plane is particularly dingy, an acid solution is used which shines the craft. One airline estimates it takes 8 man-hours per DC-6 to clean the exterior and over 11 man-hours for the interior.

Capital's annual expenditure for soaps, scouring powders, and detergents is about $35,000. A major cleaning of one of the company's planes takes 40 man-hours. The annual total for the company's fleet of 60 airplanes is 150,000 man-hours. It costs approximately 8 dollars for materials to clean one plane. Interior cleaning is a daily job. Detergent suds are used for cleaning seats, curtains, and rugs. Windows are cleaned with an antistatic polish which resists dust. Scouring powders are used on metal sinks and buffets. Head rest covers are changed daily. Another airline's crews use plain soap and water with a portion of sterilizer to clean painted surfaces. Overseas planes are also fumigated.

Jet planes are easier to keep clean due to the nature of the power plant installation. On the other hand, jet planes must be kept cleaner because their very high speed magnifies the effects of dirt on general performance, hence they have more to gain from cleanliness than slower, propeller-driven planes.

Railroads vs. Dirt

The railroads wage a continuing war against dirt also, though dirt does not have the same effects on performance as reported by the airlines.

(For further details, use Key # G-20 on free Inquiry Card on page 71)

The New York Central, for instance, reports "our equipment department has not uncovered any evidence that indicates dirt on our trains affects either speed or fuel performance." But, the railroad adds, the reason for this is simple—trains are scrubbed regularly and therefore do not accumulate quantities of road dirt in sufficient amounts to have any measurable effect.

The New York Central and the Pennsylvania railroads have virtually identical washing facilities with semi-automatic machines designed specifically for cleaning locomotives and passenger coaches. The Pennsylvania completed its first such installation in 1947 at Sunnyside Yard, Long Island. The equipment measures some 300 feet in length and rises as much as 15 feet above each side of the track. It scrubs, rinses, and polishes as many as 100 giant engines each 24 hours. The machine can clean one locomotive every 15 minutes, compared with 2 hours and 55 minutes required by the old hand method. More frequent cleaning jobs reduced the amount of repairs and replacements of moving parts.

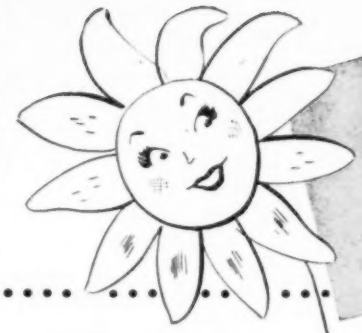
The locomotive passes through 10 stages in going through the washing installation, which features horizontal as well as vertical rotary brushes and revolving pinwheel sprays for jets of steam and hot water used in removing grease from the wheels and other sections. A crew of 4 operates the installation.

Another leading road's installations at High Bridge station in the Bronx, New York, have a capacity of 400 passenger cars each normal workday. As the cars move through the washing station, they receive one complete bath of cleaning solution and are washed down with 2 clear rinses. The trains run the cleaning "gauntlet" at a speed of 2 miles an hour.

The railroads are convinced that clean trains mean better service and satisfied travelers. One road states that all passenger trains, including troop trains, are given the same attention with respect to cleanliness. Train interiors are cleaned at the end of each run. Windows are washed with soap and water—manually in the larger stations, as well as by mechanical means at periodic cleanings. Car inspectors decide when the cars need a house cleaning. They are then scrubbed with hot water and a soap solution and seats are vacuumed and scrubbed with an upholstery cleaner.

At only one terminal of one large road it takes more than 30 cleaners and a foreman to do the job. During a cleaning overhaul, passenger cars are shampooed and manicured in a manner few homes enjoy. All seats are removed and the entire interior is cleaned either with a vacuum hose, scrubbing brush, water jet, mop or squeegee. Ceilings are washed down; floors, window ledges, and arm rests are thoroughly washed; and exteriors are given a bath of oxalic acid suds and rinsed down after scrubbing with long-handled hose-brushes.

Similar housekeeping goes on constantly at several locations of various



wear a

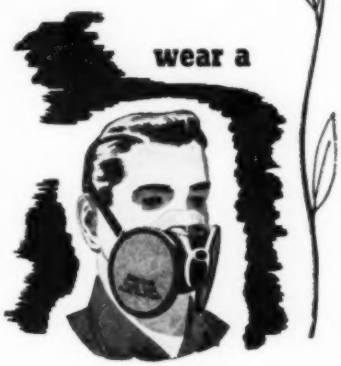
Dupor No. 24

The Respirator that is U.S.B. of M. Approved for Type A Dusts

More than 24 sq. in. twin filter area. Sanitary face cloth. Soft rubber face mask. Has all patented DUPOR features including bulb valve-controlled breathing—panorama view with no blind spots. A favorite for years!

Sample sent $3.00 ppd

wear a



Dupor No. 46

U.S.B. of M. Approved Respirator for Type A and Lead Dusts

More than 46 sq. in. filtration area. Soft rubber face mask. U.S.B. of M. Approval BM-2124 for LEAD Dusts and ALL other toxic or poisonous dusts as well as Type A (Pneumoconiosis or Silicosis-producing dusts). Unit has exclusive controlled breathing valves to guard against stale air. Maximum visibility—no interference with goggles or glasses.

Sample sent $3.25 ppd

For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles.. $2.00 ppd.

H. S. COVER, South Bend, Ind.

(For further details, use Key # G-21 on free Inquiry Card on page 71)

lines and "quickie" cleaning jobs are done wherever trains make stops of sufficient length.

Car Cleaning Pays

Would it pay—in all ways—to keep your own car clean?

It's easy enough to see why cleanliness pays off for the airlines and railroads, but judging from the many dirty cars one sees on the highways, it is apparent that many car-owners have yet to be educated to the value of a clean car.

The Hertz-Driv-Ur-Self System reports that a clean car rides better and safer on less fuel, as well as looking better and lasting longer. The company's maintenance department uses detergents to wash its car bodies. Rugs are soap-shampooed, as are plastic seat covers. Even upholstery is soap-shampooed, if there is time. Wax is used on wood trim. Scouring powder is used on white wall tires, along with a brush and hose.

If you let your car stand any length of time after it has been splashed, the crust is more difficult to remove and you risk scratching the paint; hence it is to your advantage to remove it as soon as possible. Salt used in melting snow is particularly harmful to the finish of a car and should be removed as quickly as possible.

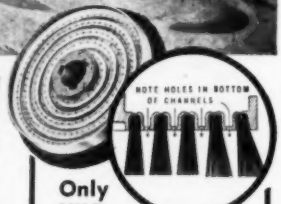
The Dales Car Washers, Inc. also point out that dirt on a car has an abrasive effect on the finish and produces rust. The company uses detergents in cleaning cars and also uses a chemical solution for interior upholstery spots not ordinarily removed by soap or detergents. Plastic seat covers are wiped off with a damp cloth. White walls are cleaned with a steam machine which used a special soap that dissolves in steam. Convertible tops are washed as often as necessary. The abrasive effect of dirt is particularly noted in light-colored cars, which will change color if not washed frequently. From private automobiles to crack trains and giant air transports, clean vehicles are longer lasting, safer, use less fuel and look better. They are a triumph of modern maintenance.

Pictures by courtesy of The Association of American Soap & Glycerine Producers, Inc.

Clean...Dry...*Slip-safe* Floors IN JUST 90 SECONDS!

HILD System of Shower-feed Scrubbing and Vacuum Drying cleans up every danger spot

So speedy is the HILD System that dangerously dirty floors can be scrubbed during working hours without interrupting machine operation for more than 90 seconds. And that means scrubbed *thoroughly!* Both the HILD Shower-feed Floor Machine and the HILD Portable Vacuum are designed to reach hard-to-get-at areas beneath and between machines. Action of the HILD Shower-feed Brush quickly loosens stubborn grease and slippery oil. The HILD Vacuum then *instantly* and *completely* suctions up the dirty scrub-soap solution. Floors are left clean, dry and *slip-safe*... without rinsing or mopping. Total time elapsed—JUST 90 SECONDS!



Only HILD has the Patented Shower-feed Brush

Diagram shows how the cleaning solution flows from tank on handle through accurately spaced holes penetrating brush back between each row of bristles...for thorough scrubbing with utmost economy. **Ask for free demonstration.**

Mail Coupon for FREE BOOK

HILD System MAINTENANCE EQUIPMENT & SUPPLIES

HILD FLOOR MACHINE CO., Dept. SMP 7
740 W. Washington Blvd., Chicago 6, Ill.
Gentlemen: Please rush your FREE 24 PAGE BOOK on Floor Maintenance.

Name _____

Address _____ State _____

City _____

Per _____

(For further details, use Key # G-22 on free Inquiry Card on page 71)

Truck Safety Record (Cont'd)

(From page 43)

dents." He also recommends that the Interstate Commerce Commission amend its report procedure so as to distinguish between traffic and non-traffic accidents involving commercial vehicles, and to take into consideration the increased number of vehicles, the increased mileage, and the fact that inflation has changed the criterion for a 100 dollar property damage accident.

What's New
See pages 67–70

Young Driver Education Needs More Attention

A BIGGER role for education in the nation's efforts to reduce highway accidents is urged by Price E. Clark, educational director of the Association of Casualty and Surety Companies. In an address before a Virginia meeting of 300 health education and safety teachers, he described the constantly growing accident toll as "the greatest uncontrolled social, economic and humane peacetime problem confronting the nation, second only to national defense." He asserted that society's hoped-for success in controlling traffic accidents adequately depends to a large degree on "unretarded development" of education's full-scale contributions towards making highways safer, through both high school and adult courses in driver education.

Universal driver education programs reaching all future drivers attending high schools can help greatly in attaining this objective, Mr. Clark continued. Such courses are now offered by 8,000 U. S. High schools, teaching 700,000 students annually how to be safe drivers. Adult driver education programs also are becoming more popular, he asserted, adding to the long-range potential of decreasing accidents through instruction.

"Driver education is no longer a step-child of American education and should not be regarded as such," said Mr. Clark. "It has grown up and deserves respect as a lifesaving program that is needed everywhere. It has proved itself worthy of adoption by every high school in the nation as a full-fledged member of the scholastic family."

Full Courses Needed

While the general trend is toward giving driver education programs proper recognition, status and credit in the curriculum, he said, far too many schools do not have full courses in the subject. Instead they have special units in highway safety that are integrated as a part of some other course, usually in the social studies field. Mr. Clark urged that such "inadequate" courses be expanded to full status.

Mr. Clark, who directs the driver education work and award program of the Association's accident prevention department, also urged that greater attention be given to teen-age safety conferences at local and state levels. Such meetings, he said, have been organized by teen-agers themselves because driver education has aroused their interest in the problem of safer highways. Colorado, Florida and Chicago already have held highway safety congresses by young drivers, he added, and every state and city should encourage development of youthful interest in ways to prevent highway accidents.

Further expansion of driver education in the nation faces a "bottleneck" in most states because there is a shortage of adequately trained teachers, Mr. Clark concluded.

THESE TWO FEATURE ITEMS
ARE PLENTY TOUGH
THE DAVIS LINE FOR LINEMEN
MADE RIGHT FOR LONGER LASTING LIFE
DAVIS TOOL BUCKETS
DAVIS GLOVE BAGS

TOOL BUCKETS—Made of 18 oz. canvas in one piece. Bottoms are tough, water-proofed one piece formed leather to resist weather rot and warping. Heavy stitching stands up under tool abuse in hitting bottoms. Rim of bucket is reinforced by specially shaped, rolled fibre ring. Send for list of available sizes and types.

GLOVE BAGS—Proper size to hold any length rubber gloves and protectors without folding. Gusset sides permit carrier to be flat when empty. Two-way snap hook with D ring permits bag to be attached to belt. Made of heavy, closely woven No. 6 waterproof duck—double stitched. All seams are bound for longer life. Write for prices.

OTHER DAVIS ELECTRICAL SAFETY EQUIPMENT

SAFETY STRAPS • BODY BELTS • CLIMBERS • CLIMBER STRAPS
LINE HOSE BAGS • RUBBER GLOVES • GLOVE PROTECTORS
UTILITY WARNING SIGNS • BELT BAGS • RUBBER HATS, COATS,
BOOTS • LINEMEN'S TOOLS • BLANKETS AND HOLDERS, ETC.

SEND FOR OUR COMPLETE PROTECTION CATALOG

DAVIS EMERGENCY EQUIPMENT CO., INC.

64 HALLECK ST., NEWARK, N. J.

(For further details, use Key # G-23 on free Inquiry Card on page 71)

WHY NOT A PICK-UP CAMPAIGN TOO?

IN SPRING a safety man's fancy, be he young or old, turns to campaigns. Clean-up, paint-up, check-up, etc. are high on his agenda. It seems to us that one other "up" campaign might be added to this list . . . a pick-up campaign. It would be carried on the year round, as well as having a week or month devoted to it. By a pick-up campaign we don't mean simply getting Junior to pick up his clothes or his toys. We mean getting employees in industry to make a concentrated effort to pick up tools and other potentially dangerous objects which seem always to be lying about.

Let us relate just two accident true stories to illustrate what we mean. In the first case a man was hit on the head and cut seriously by a falling bottle of oil that someone had carelessly left on the tramway above his workbench. In the other a worker received a fractured skull when he stumbled and fell over a wrench that a fellow-worker had left lying on the floor near his machine. Examples are inexhaustible, but a good old-fashioned safety drive incorporating some intense effort could, we think, make workers aware of this careless practice and the serious accidents it leads to.

BIG INJURIES OUT OF LITTLE ACCIDENTS GROW

THIS man managed to make something out of nothing. Working at his machine, he happened to pinch his thumb. A small blood blister formed. He must have had a suppressed desire to be a surgeon, for he got out a needle and punctured the blister. He was either a poor doctor or a nervous patient because the shock caused him to faint. If he had been lying on a couch in the plant first-aid room with a nurse or doctor in attendance, his faint would have been just a relaxation, but he was standing on a concrete floor. It was a catastrophe. When he finally entered the first-aid room, to which he should have gone under his own power in the first place, he was carried in with concussion of the brain, a fractured wrist, a severely lacerated chin and several missing teeth. No machinist would think it strange that a doctor can't run a lathe, but apparently this one thought a machinist could be a doctor without any trouble. He was wrong.

DOWN ON THE FARM

THE tremendous mechanization of farming in this country has made the farm almost as dangerous, from an accident point of view, as the machine shop. The same accidents to hands and fingers are occurring in both places. For example, a ranch hand was feeding a hay chopper by hand and cut off two of his fingers. A hay chopper is no different from any other machine as far as guarding is concerned. To protect the point of operation a guard should be built far enough away from the cutters so that the hand cannot reach the danger zone. In another case, a farm laborer caught his left hand in the chain and sprocket of a hay bailer. He lost his hand. All chains and sprockets should be completely shielded just as in a well-run industrial plant. And yet another example—a harvest hand was working on a harvester. He was caught in a moving belt and his right arm was torn off. It must seem repetitious to say that belts and pulleys must be guarded, but how many people have seen a late model harvester out in the field with no less than 20 belts spinning away on one side protected by—a sign "keep away from moving belts!" A screen over the entire side of the harvester would really do the job.

WHAT YOU DON'T KNOW . . . CAN HURT YOU!

A SUBSTITUTE operator was heat-treating small cast iron parts in a furnace. Eight gas burners were used to fire the furnace. Suddenly the burners and pilots failed. After several seconds delay the substitute attempted a re-light. The ensuing explosion blew the roof off the furnace and damaged the burners and flooring. Luckily, the novice was uninjured. This is another example of what inexperience without proper supervision or instruction can do. The man was not using his head when he attempted to relight the burners, but the basic responsibility must lie with supervision, which failed either to have a qualified worker at hand, or to post instructions for safe operating procedure. Ignorance may be bliss, but what you don't know will hurt you eventually!

Learning . . . . the Hard Way

SHORT-CUT . . . EH! WELL, A CUT ANYWAY

THIS man was working on a loading platform and wanted to continue his work in the railroad cut next to it. There was a staircase at the end of the platform, which he could have used to get down into the cut. However, he wanted to get down quickly. The easy way, he thought, is to jump down into the cut from the platform. He tried it. When he landed his legs buckled under him and struck the bumper of a car being loaded. Stairways are the best things man has invented for getting up and down, jumping is for kangaroos and track meets. This man found the easy way, the hard way.

THE PROOF OF THE PUDDING . . .

ONE morning in this plant five different employees pointed out a hazardous condition. Five times it was supposed to be corrected, but five times someone forgot, didn't bother or ignored it. The excuse was usually that something else had to be done first. Well, the five employees were proved right, because later in the afternoon the hazardous condition did cause an accident. It is worth wondering how happy the five employees were to have been proven right . . . the hard way. Anything that has been reported dangerous should be repaired immediately . . . if it can't be done at once, no one should be allowed to work near it.

"I DID IT THAT WAY LAST TIME . . ."

MANY accidents occur because people do things automatically. Because a certain process worked "this way" a certain number of times, people forget that each operation is different and requires an alert "new" attitude. This applies even to such automatic processes as punch press operations. Each piece of stock is different, each stroke of the ram different from the last and each finished piece a little different than its brothers. The difficulty lies in keeping on your toes each time, because the differences are so small. In one instance at least, the differences were so minute that careful inspection would have been needed to reveal them. An employee in a chemical lab was connecting a flask to other equipment. As she attached it, suddenly it crushed in her hands, cutting them badly. Subsequently it was discovered that a gradual accumulation of minute scratches had lowered the strength of the flask to the point where it disintegrated under normal handling.

KING-SIZE HOT FOOT

A PAINTER was mopping a floor with alcohol to remove the wax. His helper was operating a buffer on the floor at the same time. The buffer struck a radiator and produced a spark. The spark ignited the alcohol on the floor and the man mopping it received bad burns on both his legs. In the first place, there are safer ways of removing wax than mopping the floor with alcohol. More important, however, is the oft repeated warning not to use flammables near anything which might cause a spark. There was no reason why the buffer should have been operated on the floor at the same time as it was being mopped with alcohol.

NOW YOU SEE 'EM . . . NOW YOU DON'T!

IF YOU'VE ever watched a good magician, you know that he appears to make things appear from nowhere and disappear into thin air. But, if you've ever talked to a good magician, you know that he'll tell you that it was just a trick and there is a rational explanation for his seeming magic. This applies to accidents too. They may seem to happen mysteriously, but a close investigation will show that if you had been watching closely you could have foreseen them. Here's a mystery about a truck-driver who parked at a curb in front of a car while he checked the fuel-oil tank. When he returned to his truck, he looked behind him and there was no car parked behind his truck. He entered the cab and as he backed his truck to leave the curb, he backed it into an automobile! Amazing? The driver is the one to solve this one. Evidently a car pulled in behind him while he was climbing into the truck and backing up. The mystery is not how the car got there, but why the driver didn't look into his rear view mirror as he backed up. He should never have relied on the car not being there just because it wasn't there when he looked last. Automobiles are faster than the eye!

The Case For Coated Salt Tablets

By MITCH HALPERIN
A. E. Halperin Co., Inc.
Boston, Mass.

IT IS a known fact that when we perspire freely during the summer "dog" days, the body loses the vital salts it has gained by eating. It is also a clearly established fact that the best and most practical method of restoring these lost salts is through salt tablets (sodium chloride).

During World War II the Army issued as almost standard equipment a liberal ration of salt tablets, especially to those soldiers who were stationed in hot climates and to all personnel in the summer. The Army reasoned that by restoring lost salt through salt tablets the soldiers could maintain their efficiency even through the hottest and most humid days. The one major drawback to this system was the surprisingly high percentage of those who could not introduce this concentrated form of salt into their system without being overcome by nausea.

Stomach disorders and nausea resulted because the salt tablets were uncoated and would dissolve in the mouth in a matter of seconds after taking. However, late in the war salt tablets were introduced which were coated with non-toxic ingredients, generally a vegetable coating. This allowed soldiers to swallow the tablets more readily, and the coat-

ing regulated the disintegration of the tablets in the lower digestive tracts. In this manner, the salt tablets dissolved slowly and the salt factor was thus introduced evenly.

Industrial Application

Immediately following the war this principle of slow-dissolving coated salt tablets was introduced in industrial plants as an effective method of combating production slowdown. Workers who perspire freely lose their production efficiency as the hot humid afternoons wear on. It then becomes a very profitable investment for management to install these coated and regulated salt tablets in disposable dispensers near water coolers.

Employees get into the habit of taking a few salt tablets every time they go to the water fountain. When the lost body salt is replaced there is a noticeable lift and workers began to feel more refreshed; their outlook is more cheerful and they maintain a steady production rate throughout the hot summer months.

The tablets themselves are individually coated. Gums and essential film forming constituents of cellulose ester afford an exceptionally fine protective coating and maintain a sturdiness without impairing the absorbtion and disintegration rate. This regulated disintegration rate requires up to 80 or 100 minutes for complete dissolving, although dissolving begins immediately. In this way the immediate taste of salt is completely eliminated.

More and more plants are introducing coated salt tablets to reduce their summer manpower loss. Though costing somewhat more than the plain salt tablet, coated tablets are rapidly gaining popularity because they produce no disagreeable after-effects.

Dispensers

Another factor not to be overlooked is the long period that coated salt tablets can be stored without deterioration. The coating withstands rough handling that it sometimes absorbs by shipping. Coated salt tablets will not absorb moisture from even the most humid factories. There have been cases where the metal on the outside of the disposable dispensers has rusted, but the tablets inside have maintained their properties in toto.

The larger manufacturers of these coated salt and salt and dextrose tablets have also instituted the disposable or expendable dispenser idea. The main purpose of this feature is that, after the contents are exhausted the dispenser can be thrown out. Management has long voiced objection to keeping dispensers on their walls all year round due to long-term abuse. The disposable dispensers each come with attached metal brackets or hangers and can be installed within a matter of seconds.

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The Fire Front

April Fire Losses Down

ESTIMATED fire losses in the United States during April amounted to $67,362,000, it is reported by the National Board of Fire Underwriters.

According to Lewis A. Vincent, NBFU's general manager, this $67,362,000 loss represents a decrease of 19.3 percent from losses of $83,471,000 reported for last March (1953) and is approximately the same as losses for April, 1952 which amounted to $67,380,000.

Losses for the first 4 months of 1953 now total $300,198,000, an increase of 5.8 percent over the first 4 months of 1952, when they amounted to $283,714,000.

These estimated losses include an allowance for uninsured and unreported losses.

U. S. 1952 Fire Losses Reach All-Time High

THE estimated destruction of property by fire in the United States during 1952 rose to a new peak of $815,134,000, an increase of 11.6 percent over 1951, the National Board of Fire Underwriters reports. This loss estimate exceeds by 3.8 percent the board's preliminary one of $784,953,000.

In accounting for the continuing high trend in fire losses, W. L. Nolen, chairman of NBFU's committee on the statistics and origin of fires, says that various factors in the nation's economic life are responsible, among them rising prices, mounting production and greater values exposed to fire.

Twenty-five years ago property fire loss in the United States approximated $473 million, so that dollarwise in that time losses have increased over 70 percent. In this same span the population of the United States has grown by 35 million people.

"If the over-all expansion of our national economy accompanying this rise in population, together with the change in the value of the dollar, particularly in the last 10 years, are taken into consideration, the present fire loss level can be viewed in a different perspective," Mr. Nolen explains, "and the picture is not as somber as the stark figures would indicate."

Mr. Nolen also points out that advances in fire prevention, construction and safety measures, together with improved methods of fire fighting evidenced by the absence of major conflagrations, are in no small measure responsible for keeping the annual destruction by fire from exceeding the present levels.

Fire Facts

He adds that in 1952: building fires increased one percent; other than building fires increased 28 percent; "manufacturing" fires decreased 4 percent; "storage" fires increased 12 percent; the population category with largest increase in fires was that between 25 thousand and 50 thousand which showed an increase of 14 percent; the population category with the largest decrease in fires was that between 100 thousand and 250 thousand which showed a decrease of 11 percent.

Other facts that Mr. Nolen discloses deal with fires resulting from known causes over the past 10 years. The figures that follow are for reported fires, where the cause is ascertainable, excluding incendiarism, and do not represent the total number of fires. Excluded are all unreported losses as well as all fires resulting from unknown causes. It is estimated that the aggregate property loss in the United States during this decade has been approximately $5.5 billion.

Causes	Percent of Property Loss
Matches—Smoking	17.18%
Misuse of Electricity	11.64
Exposure (Fire originating off premises)	11.29
Sparks on roofs	1.83
Overheated or defective Chimneys, Flues, etc.	6.40
Lightning	5.13
Stoves, Furnaces, Boilers and their Pipes	8.90
Open Lights	2.96
Petroleum and its products	8.86
Hot Ashes and Coals—Open Fires	2.04
Ignition of Hot Grease, etc.	2.09
Spontaneous Combustion	6.09
Gas—Natural and Artificial	2.33
Sparks Arising from Combustion	1.78
Rubbish and Litter	1.40
Miscellaneous—Cause Known but not classified	4.59
Friction, Sparks from Running Machinery	3.24
Explosions	2.17
Fireworks, Balloons, etc.	.08
	100.00

Jet Fuel Fire Hazards Greater Than Expected

FIRE authorities are shocked to find that the fuel fire hazards of jet aircraft are more severe than those

in today's commercial planes. It had previously been hoped that jets could be operated on kerosene with less hazard than gasoline grade fuels presently used in reciprocating engines.

Harvey L. Hansberry, Chief of the Power Plant Branch of the Civil Aeronautics Administration Technical Development Center, told an aviation seminar held as part of the 57th Annual Meeting of the National Fire Protection Association that the reason for the greater fire hazards in jets is that "the jet uses more fuel, at higher rates and at higher pressures than piston engines." Mr. Hansberry warns that "right now, while jet power plant developments are in a relatively early stage is the proper moment to emphasize fire prevention and control features." He adds that internal failure in jet power plants can result in "something resembling an explosion with complete disruption of the engine itself and major damage to surrounding equipment, lines and structure." As compared with this, piston engine failure normally results in "shoving aside a cylinder or cylinder head which, in itself, is not catastrophic."

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Dry Chemical for Oil Well Fires

AMONG successful achievements of dry chemical is the recent extinguishment in 50 seconds of an oil well fire in the Texas Las Mercedes field. Previous to the put-out by dry chemical, the fire had burned for five days, resisting attempts at extinguishment by other agents.

At another plant in Texas eleven small tanks containing gasoline and high voltage material recently caught fire at the vents when lightning struck one of the tanks. Working with hand dry chemical extinguishers as well as wheeled units mounted on top of a truck, the safety director and fire marshal achieved complete extinguishment in a few minutes.

In Northern Oklahoma, a small gas well caught fire during drilling. Water from a fire pumper failed to put out the fire, so the local superintendent decided to experiment with three hand dry chemical units, to see what effect they would have. Somewhat to his surprise, the fire was completely extinguished in a few moments.

Then, to the puzzlement of bystanders, the superintendent immediately ordered the fire ignited again. His reason: he had no equipment to cap the well on hand, so it was deemed safer to let the well burn than risk accidental ignition and explosion of gas drifting over nearby residential areas. When capping apparatus arrived, the men achieved quick extinguishment with dry chemical again, and then capped the well.

LET'S DISCUSS: OXYGEN SAFETY IN HOSPITALS

By H. A. McKENNETT

THE safe handling of oxygen and oxygen equipment in hospitals has been given only slight consideration by hospital administrators and professional or lay staffs of a great many institutions.

Yet safety in the handling of oxygen is of such importance that it is constantly watched by government and local agencies—The Interstate Commerce Commission, the Food and Drug Administration and local health and fire departments being a few.

Psychologically the different kinds of persons who may be called on to handle oxygen fall into 3 groups:

a. People with a fear of oxygen. This group lacks the proper instruction or education in the handling of oxygen and oxygen equipment. These people make very good students, however, and respond well to instruction.

b. Careless individuals. This type of person passes remarks such as, "I can extinguish a lighted match with oxygen!" (He figures the pressure from the cylinder will blow the match out before the oxygen feeds its flame.) He is also known to say, "I can drop a cylinder and it won't break. (He is thinking of the casing and has not even imagined what would happen if the cylinder valve sheared off.) He may even brag about his horseplay with oxygen, after instruction. He is more dangerous than oxygen and a very poor risk when handling it. Don't mix the two—chances are they will produce an explosion.

c. The experienced licensed technician. This group has had education and instruction in oxygen safety as well as oxygen therapy and is under the supervision and inspection of the local agency that issues the license. These technicians know and respect oxygen and handle it with care and intelligence.

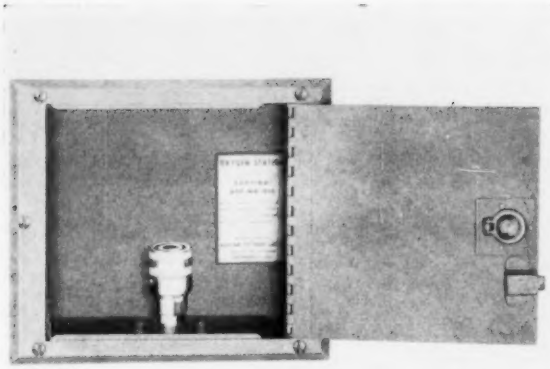
All hospitals should make it an essential part of their training programs to hold classes of instruction in the handling of oxygen and oxygen equipment at least once a year; and, in the case of larger hospitals, twice a year. The classes should contain doctors, nurses and all lay personnel who may come in contact with oxygen equipment.

Handling Procedures

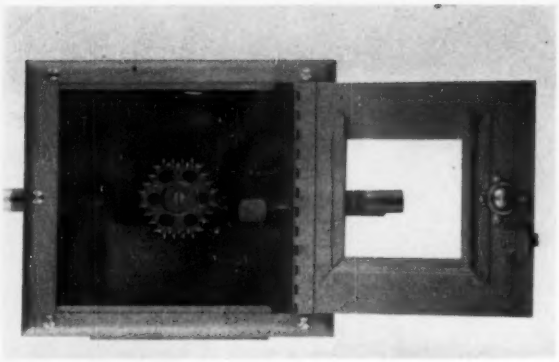
Here is an outline of suggested safety measures in handling oxygen that should be part of each hospital's procedure book.

Oxygen tanks or cylinders should be stored in a cool room in two separate areas, one area for full tanks only and one area for empty tanks. All tanks must be stored with cylinder caps on and oxygen cylinders should never be stored with any other gases. The danger of leakage, mixture and explosion is increased many times, if they are stored together.

When a tank or cylinder is taken from the storage area the main valve of the cylinder should be "cracked" or tested. How does one go about cracking? He turns on the main valve for a second to check for leaks and to clear the valve of any dust.



Hospital room outlet supplies piped-oxygen to oxygen apparatus.



Emergency shut-off valve for piped-oxygen outlet is in corridor.

This should not be done in the patient's room, of course. When opening the main valve of a cylinder, the outlet of the valve should always face away from you.

Cylinders or tanks of oxygen must always be made secure so they cannot be tipped over, especially when being transported or when placed at the patient's bedside. They should never be placed near radiators, steam or hot water pipes. No more than two manifold cylinders should be placed at a patient's bedside at any one time. The litre flow should be turned off and set at zero before the main valve is opened.

Oxygen tents should always be checked for mechanical performance before being placed in a patient's room. The electric plug, the extension wire, and the performance of motors and compressor are some of the danger spots to be carefully checked. Tents should be checked every 3 to 6 months and a complete record of each individual tent noted. Tent canopies need even more frequent checks for leaks in seams, zipper openings and hanging loops or rings. This will prevent free oxygen from raising the oxygen concentration in the room in which the tent is being used. It is also recommended that a tent not be used in a room with more than 2 disabled persons. The tent should be on the bed nearest the door and on the side of that bed nearest the door. In case of emergency the oxygen can be quickly removed to the corridor.

Fire Equipment

A hand carbon dioxide fire extinguisher should be attached to every tent when the tent is in operation. A "No Smoking" sign should be placed at bedside and on the entrance of the room at eye level. These signs must also note that all electric appliances are prohibited in a room with a tent or any loose oxygen. It is wise to list electric appliances likely to be encountered on the sign: "No television, no radio, no electric bell cords, etc."

The same precautions should be taken with piped oxygen plus the additional warning, "Secure the litre flow meter in the wall outlet and test litre flow before connecting any oxygen equipment." Familiarize and instruct doctors, nurses and lay staff with the emergency shut-off valves in the corridors. Local regulations often govern people who must handle piped oxygen. New York City, for example, requires that any employee handling oxygen that is piped must have a certificate of fitness issued by the city Fire Department.

Regulators or gauges and flow meters should be checked periodically. A complete record of each regulator and flow meter inspection should be kept. Lines should be checked regularly for leaks and a record of this check also kept. There is no overall single method of checking for leaks in a piped oxygen system and a method of checking for leaks has to be worked out for each type of system.

In any case, the danger of oxygen explosion or fire in hospitals is a clear enough and present enough danger, judging from newspaper accounts of catastophes, that intelligent instruction, weeding out of unfit personnel, careful handling, regular maintenance and constant vigilance are necessary to control this hospital hazard.

Pictures by courtesy of National Cylinder Gas Co. and Sharp & Dohme, Inc.

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HEAT DETECTOR ENDS BELT FIRES

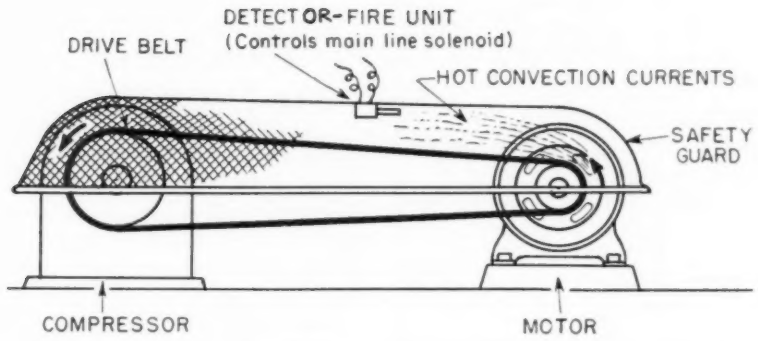

Fig. 1 This detection system prevents drive belts and equipment from overheating, by breaking the power circuit when excessive temperatures are reached. Hot convection currents are driven to heat detector by belt rotation and reflecting metal guard.

THE danger of fire around compressors and other belt-driven equipment has been eliminated in a supermarket chain by the use of a shut-off circuit operated by a fire detector.

In this system, illustrated in Figure 1, the heat detector is mounted just above the compressor drive belt. When either the motor or the belt overheats because of an overload, belt slippage, a frozen shaft, etc., the malfunction generates heat which is carried to the detector by convection currents. The detector contacts, which control the power circuit through a 110- or 220-volt solenoid, then open and cut the power to the entire compressor system.

In the year since the detectors were installed on the more than 75 refrigeration and air conditioning compressors in the supermarkets the following benefits can be noted: (1) No compressor belt fires have occurred, in contrast to an average of 5 or 6 fires occurring yearly for the preceding 15 years; (2) The spoilage of merchandise from water damage has been eliminated. Previously, burning belts had often been thrown by the drive motor into some flammable merchandise, setting off the sprinkler system; (3) Equipment life has been increased because equipment malfunctions, such as a bad bearing, insufficient lubrication, etc., show up as overheat conditions which are detected before the motor or compressor is ruined.

Aids Maintenance

Overheating of compressor belts had been a troublesome maintenance problem as well. Normal wear would gradually stretch the belts, causing them to slip on the drive shaft. The resulting friction would overheat the belt and eventually ignite it. Also, in hot weather the high temperature of both the air intake and compressor cooling water would build up the working pressure in the compressors. These excessive head pressures increased belt friction, sometimes to the ignition point. Occasionally, a burning belt would break and be thrown across the room by centrifugal force. This constituted a serious fire hazard in the back of the supermarket where combustible cartons, crates and groceries were stored.

The heat detection system over the compressor belts eliminated these hazards. After some experimentation it was found that when the compressor was running, the detector responded most quickly when it was mounted about midway between the motor and compressor. To this point the hot convection currents, generated both by the motor and by the belt on the drive shaft, are carried by the circulation set up by the moving belt. The detectors on indoor compressors are set to break the circuit at 140F, well under the ignition temperature for the belt, but high enough to avoid false alarms in summer. On outdoor compressors, the detectors are set to actuate at 180F

(Continued on page 60)

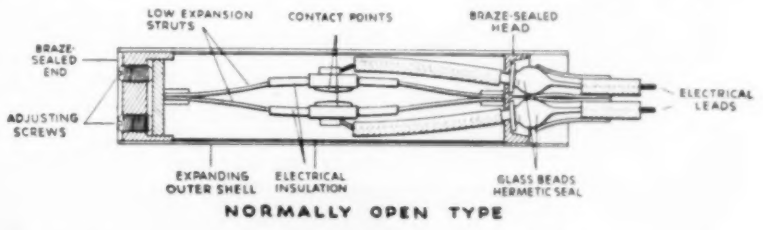

Fig. 2 Diagram shows response mechanism of typical fire detection unit. Extremely high resistance to vibration is obtained because struts are mounted under compression. Hermetic sealing protects interior mechanism from moisture and other contaminants.

because of the high ambient temperature in summer.

Detection Units

The detector units are highly resistant to shock and vibration. They can withstand severe shocks without significantly shifting in set-point temperature. This stability is important since the detector, being mounted on the belt guard, is subjected to continual vibration. The device's actuation temperature is preset and cannot be tampered with in the field, to make certain that systems will remain in good operating order without frequent rechecking. The detector is hermetically sealed to prevent moisture and other substances from corroding and fouling the interior mechanism. The unit is enclosed in a stainless steel outer shell, part of the heat sensing mechanism, which enables the unit to resist corrosion, rusting, etc., from condensed moisture that usually collects around the compressor. Also, the detector is automatically self-resetting. It will actuate repetitively without any adjustment or resetting.

All compressor detection circuits in each of the supermarkets are wired in series with the solenoid-operated power switch that controls power to other compressors and fan motors on the heat exchangers. When any one belt overheats, its detector will shut down the entire compressor system simultaneously, so that an overheat condition will attract the immediate attention of store personnel, who can then phone the maintenance department. If store personnel try to restart the system without investigating the cause of an overheat condition, the power will again cut off as soon as temperatures return to dangerous levels.

This safety cut-off system can be used with any type of belt-driven equipment. However, the belt must be sufficiently enclosed so that the heat will be collected rather than immediately dissipated into the air. For this purpose, the belt should be enclosed on both top and sides by a sheet metal guard. An expanded metal guard will not be satisfactory.

Pictures by courtesy of Fenwal Inc.

For further details on fire detection equipment see pages 8–22 of Best's "Safety and Maintenance Directory," 1952–53 edition.

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Fire Protection for Atom Smashers

PROTECTION of "atom smashers" from damage by fire has developed into a major technical problem as a result of the construction during the last 10 years of 150 such installations.

This was made known recently by Willard H. Forristall, chairman of the Joint Fire and Marine Insurance Committee on Radiation that recently completed a study of this problem.

Mr. Forristall is one of 11 outstanding fire protection authorities who studied the problem with the assistance of four atomic energy research experts.

According to the committee, "atom smashers"—machines that assist scientists in their studies of atomic disintegration and transmutation—present problems to fire protection engineers and fire insurance underwriters because they are costly, sometimes housed in combustible buildings or exposed to hazards within the buildings, and involve such inherent fire hazards as oil coolants and high voltages.

A report of the committee's study of the problem and its findings has been published under the title, "Fire Protection for Particle Accelerator Installations."

The report reviews the basic principles of high energy acceleration, describes the various types of particles used, and traces the rapid changes which have led from the little known Van de Graaff generator to the popularized cyclotron and cosmotron that now play so important a part in the fields of medi-

cine, chemistry, physics and biology.

The recommendations of the committee cover proper selection of location, the use of non-combustible construction materials, safe installation of electrical equipment, and provisions for fire detection and extinguishment.

Inquiries concerning the report should be addressed to the National Board of Fire Underwriters, 85 John Street, New York 38, New York.

New Fire Hazards

LEWIS A. VINCENT, general manager of the National Board of Fire Underwriters, told the 25th anniversary meeting of the Fire Department Instructors' Conference that much of the security and safety of the nation depends on the country's fire services.

"The threat of present-day warfare has been a factor that has accelerated bringing the services closer together," he said, adding that the local fire department, the State fire, safety and defense organizations are knit together in comprehensive plans to afford help to any area that might need it.

In addition to the threat of atomic warfare, Mr. Vincent said there will continue to be peace-time disasters making necessary more "pre-planning" for their proper handling.

In commenting on peace-time disasters, Mr. Vincent declared that recent disasters show the threat of explosion and fire from immense concentrations of flammable and combustible materials.

Besides the threat of conflagration from atomic attack and from the manufacture, processing and storage of dangerous and flammable materials, Mr. Vincent pointed out other grave fire hazards. Among them were:

—New building construction of unusual size or design, such as in supermarkets with their excessive areas, combustible contents, absence of fire-break walls.

—New methods of handling materials going into strategic stockpiles, many of them subject to damage by fire.

—New chemicals, new materials, and new methods of everyday living.

"We have fire causes today that we never heard of 25 years ago," Mr. Vincent explained, "and the fire service in the future, as in the past, will have to be on the alert for the new hazards that inevitably accompany the changes we are facing today."

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1627 K Street, N.W. Washington 6, D. C.

(For further details, use Key # G-29 on free Inquiry Card on page 71)

Poisonous Plants

(From page 23)

water. It is not recommended that soaps containing oils be used, as the poisonous agent, urushiol, is soluble in oil and will spread over other parts of the body.

Although the irritation caused by plant poisoning may be very intense, never scratch affected areas. Scratching will only spread the poisoning and greatly enhance the chances of deeper infection. In all cases of severe poisoning a physician should be contacted.

In a recent test conducted among safety personnel from all sections of the United States, the pictures at the beginning of this article were used. Each person was asked to take the same test you have taken. Here are the results— How do you compare?

12% correctly identified all three poisonous plants
20% correctly identified two poisonous plants
32% correctly identified one poisonous plant
36% did not correctly identify any poisonous plant
41% correctly identified poison ivy
35% correctly identified poison oak
31% correctly identified poison sumac

A—Virginia Creeper (Non-Poisonous)
B—Poison Ivy
C—Box Elder (Non-Poisonous)
D—Poison Oak
E—Smooth Sumac (Non-Poisonous)
F—Poison Sumac

Pictures by courtesy of Medical Supply Co.

For detailed descriptions of first aid equipment see pages 243–262 in Best's "Safety and Maintenance Directory" 1952–53 ed.

Safety Director, atop a refinery tank, checks interior for combustible gas. Device shows approach to explosive limit.

Three Steps to Refinery Safety

1. A Sound Safety Program

2. Protective Clothing & Equipment

3. Safety-Minded Personnel

MAKE safety an integral part of every job—not just the duty of the safety director—and you'll do more in eliminating the 90 per cent of accidents that are the result of unsafe acts than any other single step."

So says Frank J. Sluze, safety director of the Ashland Oil & Refining Company, Ashland, Kentucky.

Making safety an important part of every individual's job has taken Ashland far in reducing these preventable accidents. A good safety program, adequate protective clothing and equipment, and safety-minded personnel are the points on which the company's safety triangle is built.

Ashland Oil & Refining Company is a relative newcomer in the oil business, its beginning going back only to 1922. Today the refinery handles 45,000 barrels every day, making it one of the largest crude oil processing plants between the East Coast and Chicago.

Running the safety program for Ashland's more than 500 employees is no different, fundamentally, than the job of a safety director in any industry, according to Mr. Sluze. He claims that although the haz-

These white-clad tank-cleaning crewmen adjust fresh air hose masks prior to entering one of the storage tanks.

Contaminated air is drawn from tank with ventilating unit. Air circulation keeps tank cool and removes dangerous gases.

ards met in a refinery may not be the same as those met around a blast furnace or a shoe factory, the ways of combating those hazards are basically similar. His safety program includes publicity, inspections, careful instruction and training, proper protective clothing and equipment, vigilance, and never-ending work.

With this material, Ashland's safety department tries to meet safety problems realistically. Rather than make safety some separate job that requires salesmanship to keep it running, they concentrate on making safety an integral part of every individual's job.

The New Man

Mr. Sluze has found that the best way to instill this idea of safety as a part of the job is to start it as soon as a man begins work. When the new employee leaves the personnel department, the safety department takes him in hand. He tours the plant with the safety director who tells him of plant regulations and the reasons for them; of the hazards he will meet in his particular job; of fire extinguishing principles and the location of fire-fighting equipment; of protection offered by equipment made available by the company; and of the need for clear thinking and attention to the details of his job as the best way to stay safe. The new man is then fitted with his safety hat and eye-protection equipment and taken to his departmental supervisor.

The supervisor gives the new employee a similar treatment in his own department. Most of the points covered by the safety director on the plant tour are covered by the departmental supervisor as they pertain to his department. Since so much of the new man's orientation time is devoted to safety, he quite naturally starts his job with the idea that he will be confronted by certain hazards and he must be prepared for them. He has already started to think about safety as a part of his job.

If the safety training ended with this initial instruction, it would, of course, be useless. So the program is a continuing one. All the usual methods of safety communication are employed. Bulletin services from various sources are disseminated. Safety contests between Ashland and 27 other refineries; between major departments at Ashland; and between departmental sub-divisions are carried on. Scoreboards showing the number of days since the last lost-time accident are kept in the different refinery departments and a master scoreboard shows the record for the entire operation.

To keep running track of the safety program, employee plant-inspection committees make periodic surveys of the plant with the safety director who guides the tour. These tours are conducted to discover and eliminate unsafe practices and conditions. Notes of discrepancies are made and reports of these discrepancies are issued by the committees.

No formal suggestion system operates largely because none is needed. Workers cooperate splendidly in making unsolicited safety suggestions which are promptly investigated and reported on to the worker who has made the suggestion as well as to the people responsible for taking care of the matter concerned.

Monthly safety committee meetings are held. Each refinery department has its own meeting where a chairman and a secretary who are members of the department take

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(Use Key # G-30 on Inquiry Card on page 71)

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(Use Key # G-31 on Inquiry Card on page 71)

charge. The meetings are held to discuss accident causes and the ways to prevent them.

Refinery Hazards

Although almost anything can happen at a refinery, Mr. Sluze finds some of the most pertinent hazards are those concerned with falling objects and bumps while working in, on, and around the various refinery tanks and towers; and the hazards of contaminated air.

To protect against the former, all workers are issued safety helmets. These safety hats have rigid metal brims with rolled edges for full protection of face, neck, and shoulders as well as the head. Ashland has never tried to "force" the men to wear the hats, but has relied on the safety program to persuade them to take advantage of this protection. How well this method has worked is shown by the 100 per cent acceptance of the helmets at the refinery today. Mr. Sluze recalls that at one time just three employees wore safety hats.

The other important hazard, air contamination or displacement by petroleum vapors, must be guarded against in many ways. Cleaning and repairing of tanks and river barges is not permitted unless supervised by an experienced or trained foreman who has pre-determined the nature and quantity of the product in the tank. Before manholes are opened, the foreman makes sure that there are no sources of ignition nearby. Trucks, tractors, internal combustion engines or railroad locomotives can easily become the cause of an explosion, so a manhole is not opened if any of these are within 100 feet of the tank to be worked on. Wind velocity and direction are also considered if a possible ignition source is nearby.

Tank Precautions

Before personnel enter a vessel to be cleaned, the tank must be steamed or ventilated for sufficient length of time with both top and bottom manholes open. Hose or pipe used for steaming must have the nozzle bonded to the tank shell or grounded in some other adequate fashion. Then tests are made to determine if the tank is gas-free. If gas-free, then a certificate or written permit is issued allowing men to enter the vessel.

These tests are made with a combustible gas indicator. This direct-reading instrument is designed to sample and analyze, quickly and accurately, for explosive concentrations in the area. It will reveal whether the atmosphere under test is below the explosive limit, at the same time indicating how nearly it approaches the explosive limit.

When it is necessary to work inside vessels, the men are equipped with fresh air hose masks and complete precautions are taken to see that no sparks are produced. The fresh air hose mask is a respiratory protective device in which clean air, from an uncontaminated source, is supplied through a hose to a mask assembly worn by the worker in the vessel.

Hose masks are only one type of respiratory protection provided for personnel. Since there are so many jobs and situations around a refinery where respiratory dangers exist, Ashland has a complete line of masks and respirators on hand. When cleaning concrete or steel, workers wear a respirator which filters out harmful dust down to the finest particles. Where protection against vapors and low concentrations of harmful gases is called for, they use a chemical cartridge respirator. In this, twin chemical cartridges remove harmful gaseous matter from the in-breathed air.

For more complete protection than is afforded by the chemical cartridge respirator, workers use a gas mask, which offers protection from smoke, poisonous industrial gases and vapors, and carbon monoxide. The mask facepiece covers the entire face and a soft corrugated rubber tube connects the facepiece with a canister. Air enters the canister through the bottom and passes through a variety of chemicals to

(Continued on page 66)

INSIDE THE TRADE

New Selling Agent

FINE Organics, Inc. announces the appointment of Joseph G. Putnam, 3124 Lexington Road, Montgomery, Alabama, as its exclusive selling agent for its aviation-industrial line, in the States of Alabama, Georgia and its industrial line in North Florida.

The Putnam Company has technical personnel to assist aviation and industrial accounts in the solution of their chemical cleaning problems as well as over 17 years experience in the petroleum solvent field.

Officers at Universal Mfg.

THE new president of Universal Manufacturing Corp., Zelienople, Pa., producer of steel-panel scaffolding, is J. A. Kirkpatrick. He was formerly vice-president and general manager. The company's board of directors also announces the election of Bernard W. Carbeau as vice-president, and Robert L. Carbeau, treasurer, as assistant to the president.

Mr. Kirkpatrick, a native of Dubois, Pa., had previously been an executive with National Tube Company. He is a member of Iron and Steel Institute and the American Society for Testing Materials.

New Representative for Glove Company

THE appointment of The Andrew Company, 277 Broadway, New York 7, as representatives for the New England and Mid-Atlantic states, is announced by The Pioneer Rubber Company of Willard, Ohio, manufacturers of Stanzoil liquid tight industrial gloves.

Mr. A. P. Yonis, who heads the Andrew Company, was previously General Sales Manager of The Edmont Manufacturing Company, from which he resigned recently to form the Andrew organization.

New Texas Offices for B. F. McDonald Co.

A NEW branch plant and offices of the B. F. McDonald Co. has been opened at Houston, Texas. The McDonald Co., nationally known manufacturers and distributors of safety equipment, has its headquarters in Los Angeles; also maintains offices in San Francisco. The new Houston offices and plant afford a greater scope of service to the Southwest.

New MSA Vice-President

ELECTION of George H. Deike, Jr. as a vice-president of Mine Safety Appliances Company is announced by J. T. Ryan, Jr., president of the firm.

Mr. Deike has been with Mine Safety since his graduation from Pennsylvania State College in 1931 when he joined the company's engineering department. Since 1951, he has been director of engineering and secretary of the company.

Honeywell to Open New Illinois Plant

A NEW factory will be opened shortly at Warren, Ill., to expand the production of the Micro Division of Minneapolis-Honeywell Regulator Company, it was announced recently by W. W. Gilmore, president of the division.

The new plant, a 10,000-square foot building obtained under a lease arrangement, will become the division's fourth manufacturing operation, the other three being in Freeport, Ill., where the division is headquartered.

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(Use Key # G-32 on Inquiry Card on page 71)

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They stop the danger—at the source.

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Refer to page 433—1952-53 Edition Best's Safety and Maintenance Directory

(Use Key # G-33 on Inquiry Card on page 71)

Color Lighting Controls Colorblind Night Insects

NOCTURNAL flying insects are colorblind. Their eyes are sensitive only to blue light, and to near-ultraviolet rays, which are almost invisible to humans.

Joseph P. Ditchman, General Electric engineer and authority on the effect of light on animals and insects, says knowledge of this fact makes it simple to attract or repel insects during summer evenings. To attract bugs you use a blue or ultraviolet light, and to keep them away you use a light bulb which produces neither of these kinds of lights.

However, the appearance of a lamp bulb can fool you, according to Mr. Ditchman. The fact that its light doesn't appear blue doesn't necessarily mean it isn't producing some blue light. Most lamps, whatever their predominant color, also produce a mixture of colors which includes some blue.

From the standpoint of being unnoticed by insects, red or orange light bulbs are just as effective as yellow, the color commonly used for anti-bug lamps. But yellow is pleasing to humans, and is desirable because it screens out blue rays, and is a color to which the human eye is highly sensitive. Among fluorescent lamps, only gold lamps absorb the wavelengths that draw bugs, according to Mr. Ditchman.

Just as the average householder seeks to keep bugs away at night, there are some farmers, florists, gardeners, orchardists, and others, who find it to their advantage to attract them. Applying a modern version of the old "moth and the flame" story, persons to whom insects are a commercial threat deliberately attract moths, beetles, borers and other insects by the millions in order to kill them with black light insect traps.

Those who would minimize the annoyance and damage caused by flying insects during summer evenings should: Use yellow incandescent bulbs at entrances; Illuminate outdoor working areas with hard-glass spot or flood lamps mounted at a distance, so that bugs attracted to the light source will drop to the ground instead of on the people; Illuminate the immediate area with yellow lamps, and place blue or white bulbs, or a black light insect trap, at a distance from where people congregate.

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(Use Key # G-34 on Inquiry Card on page 71)

Refinery Safety

(From page 64)

deliver uncontaminated air to the wearer. At Ashland, these masks are used where, for one reason or another, the fresh air hose mask is impractical; where oxygen in the contaminated air is higher than 16 per cent; and where gaseous air contaminants do not exceed a 2% by volume concentration.

In addition to the protection given by personal respiratory devices, workers are further safeguarded by ventilating equipment. The unit is a lightweight, portable device for securing a positive, forced movement of large volumes of air both into and out of any area which requires rapid ventilation. It operates on compressed air or steam and utilizes the venturi principle to induce a rapid movement of air through it. No motor, no fan or turbine is used. To ventilate a tank, workmen place the unit in an upper manhole, ground it to the vessel and connect a compressed air or steam line to it. When turned on, it causes a negative pressure at the unit's intake and pulls air out of the tank through the upper manhole. Fresh air enters the tank through the lower manhole. In this manner, harmful gases are carried out of the tank, fresh air circulates through the tank, and the area inside is kept cool and clean.

Carbon monoxide and hydrogen sulphide are gas hazards resulting from petroleum processing so Ashland keeps on hand a carbon monoxide detector and a hydrogen sulphide detector to assure men that the atmosphere in their working areas is free of these gases.

The program and the equipment described above are typical of the efforts expended by Ashland's management and safety personnel to provide better and safer working conditions for employees. But, as Frank Sluze emphasizes, the program and the equipment are only as good as the men who use them. If the individual workman does not make safety an integral part of his job, the program will not work and the equipment will not be used effectively. It all begins and ends with the people for whom it was designed. Mr. Sluze is responsible for the beginning and does all he can to carry it through. The end is decided by the employee.

Pictures by courtesy of Mine Safety Appliances Co.

For complete descriptions of personal protective equipment and ventilators, see pages 87–242 and 400–419 of "Best's Safety & Maintenance Directory," 1952–53 Edition.

What's New . . .

For your convenience in obtaining descriptive literature of products listed here, use the Reader's Inquiry Card. Just write in the code number given with each item. Or send written requests to:

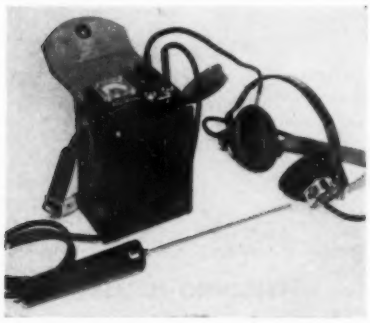
Service Dept.,
SAFETY MAINTENANCE & PRODUCTION

MECHANICAL DEFECT DETECTOR

(Use Key # 778 on Inquiry Card on page 71)

THIS portable audio-video electronic device enables maintenance men to detect noises and defects in all kinds of mechanical equipment. It enables the operator to see and hear the location of the source of trouble quickly in bearings, pistons, gears, ratchets, cams, clutches and other moving parts. It is also useful for checking performance of newly completed machines and other products.

Manufactured by the Anco Instrument Division of the American Name Plate & Manufacturing Company, the device picks up sounds the mechanic cannot normally



see or hear and cuts hours off the time required to locate the trouble. Known as Elec-Detec, this newest model includes a milliameter for checking sound impulses visually as well as audibly. The instrument consists of a metal probe, with an electric amplifier and selector housed in a carrying case and a set of headphones, as well as the video attachment. The metal probe contains a microphone that transmits impulses electrically to the earphones through the amplifier. Two adjusting knobs provide for sensitivity and volume control. The manufacturer reports that no technical training is required to operate the instrument. The accurate performance of the new video unit is assured, it is claimed, by the use of a highly stable germanium crystal diode in the circuit. This crystal serves to rectify the current to record the electrical impulses accurately on the d-c milliameter, and to provide the wide frequency response required.

MERCURY VAPOR CONTROL

(Use Key # 779 on Inquiry Card on page 71)

TO PROVIDE a dependable method of recovering mercury globules and mercury-laden dusts, and, at the same time, combat the hazards of mercury vapor poisoning, Acme Protection Equipment Company now offers specially designed equipment, known as the Acme Mer-Vac.

The device is a combination of an enlarged gas mask canister for mercury vapor collection and a powerful industrial vacuum cleaner for mercury recovery. The unit is engineered to provide the following features according to the announcement: a synchronous timer indicating when canister contents must be replaced; a special air circulation system for the motor, preventing amalgamation of wiring connections and parts; glass trap for mercury recovery; stainless steel and porcelain enameled canister parts; acid-resistant dust filter; all other parts subject to attack by mercury and other chemicals are of non-corrosive materials.

The recovery of mercury globules is effected by an extra high lift centrifugal vacuum pump, it is claimed. Vapor collection is accomplished through the same principle as in the company's mercury canisters for gas masks. Mercury poisoning is a hazard to workers exposed to mercury, mercury dusts, or smoke of mercury compounds. When mercury spillage occurs, the mercury must be picked up at once because of the hazards produced by evaporation.

With the new machines, vapor production can be eliminated by recovery of the mercury in the special trap and collection of the vapor by the chemical canister. After recovery of the mercury, the atmosphere can be further purged by continued air circulation through the canister, it is stated.

NOISE ANALYZER

(Use Key # 780 on Inquiry Card on page 71)

THE 420-A Sound Analyzer, manufactured by Hermon Hosmer Scott, Inc., separates noise, sound and vibration signals into their compo..ent frequency bands. Such frequency analysis is as important as measurement of noise in-

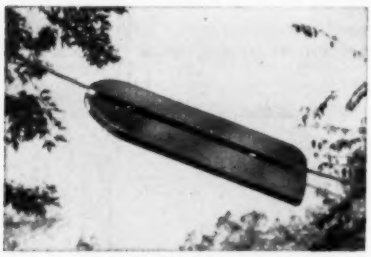
tensity for machinery and blower noise, industrial hygiene, and acoustical contracting applications. The high and low-pass filters can be independently adjusted in steps of ½ octave. A simple interlock permits the pass-band width to be fixed in any multiple of ½ octave. The position of this pass-band can then be adjusted throughout the audible range by a single control. The analyzer exceeds the American Standards Association's proposed specifications for filter-type sound analyzers.

The analyzer can be used while the operator is walking about. It includes a calibrated attenuator, an indicating meter and an output jack for general purpose filter applications. The unit may also be used as an amplifier having a range exceeding 20 to 20,000 cps. Rugged and compact, the Analyzer weighs 20 lbs. and is 10" x 10" x 6".

LIQUID CONCRETE HARDENER

(Use Key # 781 on Inquiry Card on page 71)

THIS liquid concrete hardener, called Lapidolith, is said to penetrate the surface of concrete floors and by a chemical reaction with the lime and calcium carbonate in the concrete to wear and dustproof them. Manufactured by L. Sonneborn Sons, Inc., the hardener is reported to produce a close-grained, vitreous topping that prevents traffic and trucking from disintegrating or dusting concrete floors. The chemical agents are said to reduce the porosity of the concrete to a minimum and make the floors highly resistant to oils and chemicals. Because it helps to reduce the water absorbed by the floor the hardener also checks danger of cracking from freezing and thawing. The low surface tension and wetting capacity of the agent allow it to react with such surfaces as terrazzo as well as concrete. It may be applied with a brush or a spray to vertical surfaces. Floors treated with the hardener are also said to retain their light reflectance. The chemical is added to water, brushed or sprayed on, and allowed to dry. It also hardens floors with special aggregates such as iron filings. It will not operate on painted floors. A written guarantee is furnished with the hardener. It is also said to be inexpensive to apply.



WIRE CREEPER

(Use Key # 782 on Inquiry Card on page 71)

THE device enables linemen to string additional wire through trees, over buildings, across ravines and other areas quickly and easily, wherever one wire is already in place.

The Wire Creeper, manufactured by Martindale Electric Company, is placed on the wire and, by pulling and releasing the plastic cord attached to it, the operator moves it away from him and along the wire in 10 to 20 foot leaps from one pole to the next very quickly. Trees slow the operation slightly. When the creeper reaches the next pole, the new wire is pulled across by the plastic cord.

Line splices and frayed insulation are no problem for the device. It will travel up steep inclines and through twigs and foliage of surrounding trees, according to the manufacturer. For night work, a luminous bottom permits the operator to follow its progress closely. Besides its speed of operation the device enables a smaller crew to string more wire. It eliminates the hazard involved in climbing trees, fences, hills, etc.

LINEMAN SHIELDS

(Use Key # 783 on Inquiry Card on page 71)

DESIGNED to protect linemen from electric shock or electrocution, these linemen shields or "Pigs" are the product of the Lineman Protector Company. Taking the basic idea of a shaped rubber blanket, the company has perfected the design and added straps and rings for easy attachment. The shield will cover the insulator and leads on either a single or a double cross arm installation. They have also been cut in half to provide effective coverage for the lead and insulator on a "dead end."

The shield is built to withstand a 10 second test at an electrical pressure of 30 thousand volts. It also has several ease and economy of handling features. One "pig" will cover a double cross arm installation, cutting time required to raise and lower equipment. This lineman shield also overcomes the difficulty of different-sized insulators, since it fits them all.

SYNTHETIC-COATED GLOVE

(Use Key # 784 on Inquiry Card on page 71)

THIS glove is coated with a synthetic said to combine the qualities of natural rubber, plastic and neoprene and yet be cooler and softer than any of the three. Manufactured by David's Gloves, Inc., the glove is black in color and is said to have excellent non-slip qualities.

Available in knit wrist and gauntlet styles, the glove comes palm-dipped for greater comfort and fully dipped for greater safety. The plastic element in the glove is reported to give positive protection against almost all acids, alkalies, chemicals, boiling water and oils.

ATHLETE'S FOOT CONTROL

(Use Key # 785 on Inquiry Card on page 71)

TO AID industrial plants in the sanitary maintenance of shower rooms and locker rooms, Sani-Mist, Inc. announces the development of a fungicide which is said to kill the principal fungus causing athlete's foot in 30 seconds. Commercial laboratory tests show that Trichophyton Mentagrophytes meets sudden death when it meets the fungicide.

In addition to quick-killing action, the liquid has certain other advantages: (1) It is made of U.S.P. ingredients, and is said to be soothing as well as sanitizing. It may be applied full strength without irritating or harmful effects on the tender, itching, burning skin. (2) A simple, rustless, dispenser which looks like a bathroom scale makes application easy. All that is necessary is to step on the aluminum treadles of the dispenser, called the Sani-Mister, pump them several times with the feet, and step off. As the treadles are moved, the fungicide vapor is sprayed up through the treadle grill onto the toes, feet, and ankles. A treatment is complete in 3 seconds. (3) Each application is fresh and undiluted, and thus more sanitary than the familiar germicidal trough now common in the locker rooms of many industrial plants. There is then, less chance for reinfection. There are approximately 3100 individual applications to every gallon of the compound.

WELDING HELMET

(Use Key # 786 on Inquiry Card on page 71)

A NEW arc welding helmet of the lift-front type is announced by Jackson Products, Warren, Michigan. Front of lens holder, made of high-impact, molded plastic, holds protective filter lens and clear cover glass and swings up to permit inspection of work without raising the entire helmet, while another clear glass stays in place to protect the eyes. Helmet shell is of one-piece, thermosetting plastic reinforced with glass fiber. It resists high heat, high voltage, moisture and spatter, is strong and easy to clean.

Headgear has wide, flexible straps made of smooth, easy-to-clean plastic. Adjustable and calibrated to hat sizes, it is quickly made to fit before putting on, and has replaceable cork padded sweatband.

Helmet swings up on friction pivots, adjustable without taking the helmet off. Helmet comes down without jolting stops and will stay in any desired position.

ELECTRIC EQUIPMENT TESTER

(Use Key # 787 on Inquiry Card on page 71)

DEVELOPMENT of a new testing instrument designed to cut down on electrical equipment and power failures and reduce the threat of electrical fires has been announced by the Multi-amp Corporation. Before the development of this new instrument, there existed no simple, safe method of checking current-actuated protective devices in the field according to the manufacturer.

Industry has paid a heavy toll in down time and loss production caused by electrical overloads, short circuits, motor burn outs and electrical fires. Statistics for 1952 indicate that 20% of all the industrial fires last year were caused by electrical disturbances.

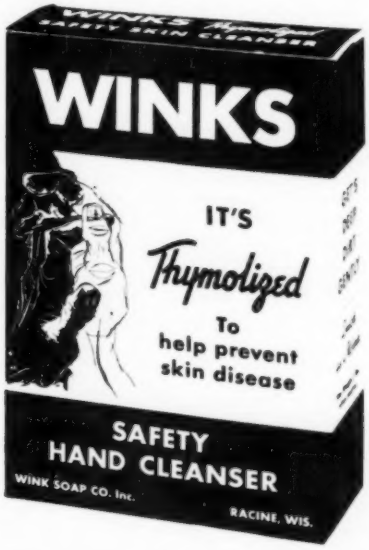
Called the "Industrial Multi-Amp," this portable high current test unit now makes it possible to check circuit breakers, overload relays and other current-actuated devices before they are installed, when they are installed, and periodically after they are in service. It is a loading device, accurately adjustable in stepless increments with fingertip control, drawing a small amount of power from the line in addition to that which is required to actuate the device being tested. It is said to be equally well suited to checking devices with high impedance and low current requirements and devices with low impedance and high current requirements.

NON-FLAMMABLE SOLVENT

(Use Key # 788 on Inquiry Card on page 71)

LABORATORY discovery of a new solvent known as Penolene 643, as a safer replacement for poisonous carbon tetrachloride is announced by the Penetone Company. Retaining all the desirable qualities of carbon tetrachloride, such as non-flammability, 15 second drying time and powerful solvent action, Penolene 643 reduces the toxic hazard to an all-time low, according to the manufacturer.

Vapor inhalation tests on live healthy monkeys show the new solvent to be 120 times less toxic than carbon tetrachloride. This makes it only slightly more toxic than kerosene. Unlike carbon tetrachloride, continued use of the new solvent will not cause a toxic build-up within the body to damage liver, kidneys or other organs. The solvent is reported to evaporate as fast as carbon tet and is equally non-flammable! This combination of safety features makes the solvent well suited for many uses: cleaning motors, electrical equipment, radio parts, coils, condensers, electronic parts, tools, machinery, fabrics, motion picture film and as a diluent. It will not leave a film or residue on the surfaces cleaned. It will not damage fabrics, electric insulation or fine electronic parts.



DISINFECTANT HAND CLEANER

(Use Key # 789 on Inquiry Card on page 71)

A POWDERED hand cleanser is announced by Winks Soap Co., as the only product of its kind containing Thymol. This antiseptic is used by the medical profession in the treatment of skin diseases. Most industrial skin disturbances start in untreated, superficial abrasions. The cleanser automatically cleans and disinfects minor skin breaks when employees wash.

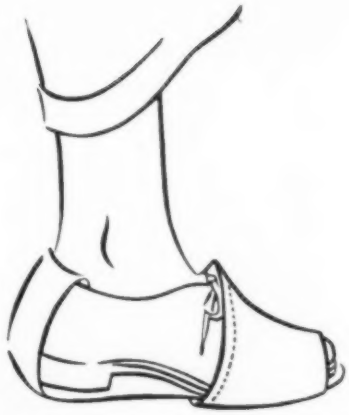
Said to cut soap cost because of large volume per pound, the soap is blended with mild synthetics to quickly remove grease and grime. It rinses freely, leaving no residue. The abrasive is cornmeal. It "gets deep dirt gently" and tends to prevent dry skin. The soap flows freely from any dispenser. A synthetic wetting agent in the soap helps it flow through drains easily without contributing to sink clogs.

CONDUCTIVE SLIPPERS

(Use Key # 790 on Inquiry Card on page 71)

A NEW adjustable slipper has been perfected by Melrose Hospital Uniform Company that has been proven successful in protecting against static electricity sparks—and consequent explosions—in operating rooms according to the manufacturer.

The slipper is quickly slipped on over the regular shoe and the one-piece conductive rubber sole comes over the heel of the shoe and back inside where it fits



snugly. Contact with the wearer is established through sock or stocking, so that cotton hosiery is recommended as most effective. Four sizes fit all doctors, nurses and visitors. Tested by a leading independent laboratory, the conductive rubber slippers were found satisfactory in conductivity and aging, even after repeated sterilization by autoclaving or boiling.

HEAT-ABSORBING GLASS

(Use Key # 791 on Inquiry Card on page 71)

A GREENISH tint glass which is said to absorb the sun's heat, reduce eyestrain and keep fading and bleaching of fabrics to a minimum is the newest product offered by the flat glass industry.

The new flat glass product, called "Solex," may be bent, laminated or tempered for use in practically every known type of flat glass application. Made specifically to reduce the intensity of solar radiation, it takes the heat out of sunshine but does so without sacrificing the light transmission characteristics of high quality glass. In some instances, it actually increases visual properties, according to the Pittsburgh Plate Glass Company.

The new glass absorbs the red portion of the solar spectrum so that the light transmitted through it is the easier portion on the eyes. While it absorbs most of the solar infrared and ultraviolet rays, at the same time it transmits adequate soft daylight for clear visibility—72 percent to 74 percent of daylight as compared to the 70 percent specified by the American Standards Association code covering safety glazing materials for automobiles. A room glazed with the product is said to be 10° to 20° Fahrenheit cooler than a room with windows of ordinary glass. The use of the product in window openings which have direct solar exposure results in materially reducing the load requirements on air conditioning equipment. In addition, it tends to produce greater eye comfort for the people in the room. The pleasant greenish tint softens light intensity and thus reduces glare.

It is a good material for use in southern and western exposures of any building where human comfort is a factor, such as offices, schools, residences, hotels, hospitals, public buildings and factories. It is of great value in certain industrial and commercial buildings where penetration of too much solar heat through window openings is dangerous or inconvenient.

PORTABLE WORK PLATFORM

(Use Key # 792 on Inquiry Card on page 71)

ATLAS INDUSTRIAL CORPORATION, New York, announces the introduction of the new Scaf-fold. This development in portable work platforms features removable gate-leg out-riggers with leveling screws. The work platform not only telescopes up and down, but also folds in and out. This device is ideal for tight spots such as getting into and out of small elevators, doorways, etc. It comes in one piece, no erection required, no loose parts; it is called safe, sturdy, yet easily rolled and easily raised. The scaffold is ideal for all overhead maintenance such as painting, lighting, cleaning, etc.

REFRIGERATOR DESICCANT

(Use Key # 793 on Inquiry Card on page 71)

A NEW moisture absorbent material for eliminating moisture from refrigerating systems has been developed by Ansul Chemical Company. The new desiccant, named An-Drite, is an important part of the new drier, which will be known as the Ansul T-Flo, because of its resemblance to the letter "T." The drier and desiccant are designed for all industries in which excessive moisture affects machine performance such as electric transformers for telephone lines, gasoline carburetors, natural and manufactured gas lines, and others. Due to interchangeability of all size driers and connectors, the drier is easy to install and easy to replace. The connectors do not have to be removed from the line when changing driers. The unit is leak tested with nitrogen at 300 lb. pressure. It may be hand or wrench-tightened, due to a new gasket principle which makes a 100 percent seal with minimum pressure. The drier can be installed by either standard flare or solder connections.

The new desiccant, is a chemically treated gelatinous aluminum oxide hydrate in the form of $\frac{1}{8}$ inch diameter spheres. Powdering has been eliminated by a special process. The desiccant does not plug or channel and is efficient at temperature ranging up to 140°F. It is non-corrosive and removes acid from refrigeration systems. The drier is available in 8, 12, 20, and 30 cu. in. sizes. Seven sizes of connectors, ranging from $\frac{1}{4}$ to $\frac{5}{8}$ in. are provided. Because of the exclusive interchangeability feature, 28 different drier combinations may be obtained by the 4 size drier units and the 7 connectors.

FLOOR DRESSING

(Use Key # 794 on Inquiry Card on page 71)

A NON-OILY dressing, designed to pick up dust—then completely evaporate—has been developed by the Hillyard Chemical Company research laboratories. Called Hil-Sweep, the new product is the result of several years work to develop a dressing that would be easy and safe for daily care of asphalt tile floors. It combines a non-oil base and a formula for dust removal into a clear, colorless liquid. When sprayed or sprinkled on a floor brush, mop or dust cloth, the liquid absorbs dust, then evaporates, leaving a clean surface. The product is reported to be non-flammable, and is said not to remove wax film, discolor or darken floors. Developed especially for asphalt tile floors, the dressing is recommended for safe use on all types of floors, walls, furniture, woodwork, blackboards or any other surface from which dust or loose soil is to be removed. Reportedly high in covering power and having a pleasant odor, the liquid is said to leave mops and dust cloths free of "loading." The mops or cloths can be cleaned by shaking and are then ready for re-use.

ACID VALVE SHIELD

(Use Key # 795 on Inquiry Card on page 71)

A NEW flexible valve shield made of neoprene synthetic rubber has been introduced by Industrial Products Company for use on valves handling acids and other hazardous chemicals. The shield, called "Chex-Spray," protects the operator from injury if the valve stem packing should fail; it cups the stem and the packing gland and prevents acid from spraying on the operator or anyone working close by. The shield is molded in the shape of a flower pot. To install it, a hole of slightly smaller diameter than the valve stem is cut or punched in the bottom. The valve wheel is removed and

the shield pulled down over the stem so that it covers the packing gland. It doesn't have to be wired in place and can be installed while the valve is in service. Where necessary, the edge of the skirt can be trimmed to suit the contour of the valve body.

A major advantage of the shield is its flexibility. It can be turned back to inspect the valve or to tighten the packing gland nuts. Since it need not be removed, there is no risk that it will not be replaced. Longer life is another advantage. Neoprene is resistant to most acids, alkalis and hydrocarbons, and in outdoor applications it is much more resistant than natural rubber to deterioration by weathering and sunlight.

Shields are currently being manufactured in three sizes, accommodating valve sizes from $\frac{3}{4}$ in. to 4 in.; shields for larger valves are contemplated if demand warrants.

LAMP DISPOSAL BAG

(Use Key # 796 on Inquiry Card on page 71)

A FLUORESCENT lamp disposal unit, manufactured by Laduby Company Inc., is now available with disposable bags to make the job of disposing burned out fluorescent lamps easier. The new bags make it unnecessary to touch the glass in disposing of the crushed lamps. The bag may be simply removed from the unit and dropped with its contents into the rubbish. Units now in use with metal perforated baskets can be converted to bag disposal easily. One hundred bags are said to handle 5 to 6 thousand fluorescent lamps. The disposal unit itself grinds up burned out lamps safely without requiring the operator to touch the glass.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Protective Dust & Gas Hoods 480
Mine Safety Appliances Co. A 2-page bulletin describes the company's line of protective hoods to be worn with respirators for extra protection against dust, paint, and chemicals. Catalog information covering material used, replacement parts and respirators usable with the hoods is included. Full specifications and illustrations of each hood are given.

Salt Tablets & Dispensers 481
Morton Salt Co. Discussed in this 6-page brochure are impregnated, plain and salt-dextrose tablets as well as tablet dispensers. Illustrated in 2 colors, the booklet points out the values and uses of each type of tablet and describes the dispensers. Background material on the need for salt tablets is also included.

Fused Bi-Colored Lenses 482
American Optical Co. A one-piece, integral unit of two different shades or types of glass lenses for melters, furnace men, foundry men, kiln workers and others exposed to intense visible light, ultra-violet and infrared radiations is the subject of this 4-page bulletin. It details the impact protection, optical qualities and varying shades of the lenses. Also covered is a clear plastic goggle.

SIGNS & SIGNALS

Sound Signal Guide 483
Benjamin Electric Mfg. Co. A combination manual, data book and catalog of sound signals, this 40-page work covers fundamentals of sound, a glossary of terms, suggested steps and guide for choosing signal equipment, specifications of various kinds of signals and hints for compiling a code signal call system. Fully illustrated, the work shows equipment for industrial, mine, outdoor and hazardous locations. Typical applications, construction features, dimension diagrams and decibel output also appear in the literature.

Fire Alarm and Signal Systems 484
Acme Fire Alarm Co., Inc. This 50-page catalog covers the company's line of fire alarm and signaling devices and systems. Profusely illustrated and including specifications, descriptions, sample layouts and code requirements, it details fire alarm, fire detector and ground detector systems; bells, gongs, transmitters, thermostats, gauges, cut-off switches, keyboards, circuit closers, annunciators, push buttons, buzzers and many other pieces of signal equipment.

Safety Poster 485
Willson Products, Inc. A 3-color poster on the subject of using proper equipment for protection when handling toxic insecticides is offered by this manufacturer. Posters are 11 by 17 inches and are available in single copies and lots.

MISCELLANEOUS

Insect Control 486
West Disinfecting Co. This booklet on Insect control offers 32 pages of information on insecticide testing methods, insect types, insecticides, equipment for control and research. Illustrations and cutaway drawings aid explanation in this 2-color work. Featured is a several page chart listing insects, identifying characteristics, where found, damage done and cost, life spans and means of control.

Dust Collectors 487
Hammond Machinery Builders, Inc. This booklet devotes several of its 20 pages to a description of various type of dust collectors. Illustrated and in color, the catalog details centrifugal separation and precipitation equipment and gives specifications and performance data for several models.

Water Pump Extinguisher 488
The Protectoseal Co. Illustrated and described in this 2-color, 2-page bulletin is a water pump fire extinguisher for hand operation, against class A-I fires. All specifications and weights are included. Among features of the extinguisher are an instant-starting 45 foot stream and machined piston fit.

Disc Type Brakes 489
Auto Specialties Manufacturing Co., Inc. A multi-colored 12-page prochure discusses the development of brakes and describes the disc-brake in particular. It points out that braking development has not kept pace with other developments in motorcars, and uses illustrations and diagrams to explain the value of the disc type brake for present-day driving.

Shear & Plier Tool 490
PTI, Inc. A 1-page bulletin on the company's combination tool for shear and plier work, this literature covers the use of the tool for all strip and wire operations. Functional devices of the tool include fence for cutting equal distances, punch for 1/8 inch perforations in 1/2 inch strips, eye-bender, pin-straightener, strip straightener and a bender and shaper for right angle bends.

BUILDING MAINTENANCE

Ladders & Scaffolding 491
Patent Scaffolding Co., Inc. Detailed in this 2-color, 16-page booklet are various devices for above-ground maintenance. Platforms, scaffolding of all kinds, different types of ladders, trestles and other construction and maintenance off-the-floor equipment are illustrated and discussed. Emphasis is on using the proper tool for the proper job.

Maintenance Check-List 492
Huntington Laboratories Inc. A 4-page, 2-color check list for maintenance supplies, this folder lists a wide variety of maintenance items. Designed for managing personnel in industrial plants, hospitals, commercial and other public buildings, the list includes equipment for sanitation, painting, floor maintenance and insect control.

Corrosion-Resistant Alloys 493
Ampco Metal, Inc. A revised 20-page bulletin, produced in 2-colors, giving complete information on aluminum-bronze alloys in corrosion resistant service, this literature gives cavitation and pitting data along with physical and chemical properties of various aluminum bronze alloys. Included is information concerning corrosion-resistant aluminum-bronze centrifugal pumps, plug valves, pipe, tube, fittings, tube sheet and available testing facilities.

Metal Movable Walls 494
The Mills Co. Fully illustrated, giving full construction details and layouts, this catalog discusses the uses of movable metal walls and covers the company's entire line of partitioning. Two-color and 50 pages in length, the catalog lists and discusses various types of partitioning as well as accessories.

ELECTRICAL EQUIPMENT & MAINTENANCE

Electro-Conductivity-Analyzer 495
Davis Emergency Equipment Co., Inc. Details of the operation and performance of an electro-conductivity analyzer is the subject of this 4-page booklet. Useful for process control, leakage detection, air pollution, purity analysis, solvent recovery and as a safety device, the analyzer's outstanding feature is its ability to discover extremely small concentrations of gas.

Linemen Blankets 496
The Surety Rubber Co. This 2-color, 2-page bulletin covers the use of a split rubber blanket for lineman protection. Fully illustrated with specifications and results of electrical volt tests, the bulletin explains that this blanket is designed to cover spool and secondary wires, switches, transformers and dead ends. Also included is climber guard and shoe.

Pin-Hole Detector 497
Branson Instruments Inc. A 6-page folder describing the theory and operation of an instrument to measure the thickness of non-magnetic coatings on conductive bases and to detect pinholes in non-conductive coatings on conductive bases, this literature includes detailed instructions for operation of the equipment. Step-by-step illustration and explanation covers all phases of the instrument's use.

Electrical Instrument Data Sheet 498
Associated Research, Inc. A quick reference data sheet covering a complete line of electrical measuring instruments, this sheet lists models for insulation resistance, ground resistance, and high voltage testing plus other special purpose instruments.

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Circuit Breakers 499
Westinghouse Electric Corp. The application of circuit breakers to reduce downtime and maintenance is discussed in this booklet. In two colors and consisting of 8 pages, the booklet gives design and operating details and typical applications for each of 7 different types of enclosures. A basic selection chart for steel enclosures is also provided as well as a downtime cost comparison sheet for circuit protection.

MATERIALS-HANDLING EQUIPMENT

Truck Safety Rules 500
The Elwell-Parker Electric Co. Thirty-four rules for safe driving of industrial materials-handling trucks are listed in this 4-page folder. Written largely in a positive form, the rules concentrate on do's rather than dont's. Compiled from the company's own experience, the rules include many situations which may confront the truck-driver.

Loading Dock Adjuster 501
Rowe Methods, Inc. A two color, 4-page brochure, illustrating and describing a loading dock platform which adjusts to different size trucks by means of an electric hydraulic system, this material contains photos of main components, engineering drawings, specifications, operating and construction data and applications.

Elevators & Cranes 502
Barrett-Cravens Co. This catalog of a line of portable cranes, material hoists and elevators is fully illustrated and contains specifications and drawings covering the equipment. Thirty-six pages in two colors, the catalog includes such varying devices as a drum and barrel tilting portable elevator, telescopic elevators and revolving base elevators.

Materials-Handling Equipment 503
Tobey Manufacturing Corp. A 16-page, 2-color catalog covering the company's line of materials-handling equipment, this literature illustrates and gives specifications for a trailer train, baggage truck, flat bed truck, platform truck, ordnance truck, multiple deck truck, and special racks and containers. All equipment is non-powered.

FLOOR MAINTENANCE

Floor-Patching Directions 504
The Master Builders Co., Inc. Pictorial directions for floor patching are given in this bulletin which appears in two colors and folds up to fit in a pocket. Various methods for installing iron-aggregate patches are shown with the emphasis on simplicity so that any handy man can do a quick and thorough job of repatching.

Steel Grating & Treads 505
Blaw-Knox Company. This three-color, 16-page bulletin lists and describes the company's line of electroforged gratings and stair treads. Exceptional strength and varying styles are the outstanding features illustrated by pictures and charts. Ease of maintenance and admission of light are also emphasized.

Safety Floor Mats 506
A. N. Brabrook. A line of rubber, asphalt, cloth, steel link, leather, wooden and fiber mats is the subject of this 16-page, 2-color bulletin. Also discussed are non-slip surfacing for stairs and spike-resistant mats. Fully illustrated, the booklet gives specifications and typical uses for the differing kinds of matting.

Conveyor Bearings 507
Arguto Oilless Bearing Co. This 20-page, 2-color catalog gives detailed information for the specification, installation and application of bearings for all types of screw and roller conveyors. Sectionalized and well-illustrated, it provides tabular data and dimensional drawings to facilitate bearing identification for replacement. Engineering information covers design and operating data, standard tolerances, clearances, press fits, and speeds and loads for live roller, belt roller and screw conveyors.

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FIRE USE ONLY
HANDS OFF
DANGER
DO NOT LOOK AT FLAME TO DO SO MAY CAUSE SERIOUS INJURY TO THE EYES
SAFETY FIRST
ALL WOUNDS NO MATTER HOW SLIGHT MUST BE REPORTED TO FOREMAN
CAUTION
ANY WORDING DESIRED MAY BE PLACED IN THIS BLANK SPACE AT ADDITIONAL COST
CAUTION
HANDS
-OFF-
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